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# THE UNIVERSITY OF ALBERTA

# FEDERAL EDUCATION GRANTS, 1945-1967: ECONOMIC DEVELOPMENT IN NEW BRUNSWICK

by

© DOUGLAS JACKSON MCCREADY

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "The Effect of Federal Education Grants on the Economic Development of New Brunswick" submitted by Douglas Jackson McCready in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Economics.

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## ABSTRACT

The objective of this study is to examine the effect of federal education grants on New Brunswick economic development from 1945 to 1967.

For the economist who is mainly concerned with the allocation of resources, the distribution of income and stable growth, the structure of government is of interest in that it implies patterns of resource use and income distribution. It is thus necessary to establish that Canada does have a federal government and how this fact influences the attainment of the economic objectives of equity, stabilization, efficiency, and growth.

In a discussion of federal-provincial financial arrangements for education, the two objectives, efficiency and growth, are most relevant. In terms of efficiency, expenditures will be sub-optimal if spillovers exist. Federal grants can thus be justified in overcoming this allocative inefficiency. Federal grants would also be justified if provincial growth can be shown to be stimulated by them.

The effect of federal contributions to education, the percentage of 5-24 year olds enrolled in public education, the percentage of total enrolment in post-elementary schools, and net migration by education level on per pupil

current education expenditures are examined closely. The migration variables (measuring spillovers) appear to be insignificant in the determination of per pupil educational expenditures which might indicate that spillovers can be discounted as a justification for federal grants to education.

The effect of education expenditures on economic development can be examined by use of the simple correlation, the manpower needs, the returns-to-education, and the residual approaches. The latter appeared most useful as a means of measuring the importance of federal funding of education as an input into the production process in New Brunswick. To further supplement the analysis, the data for federal education grants are derived in a complete review of the historical development of the many different programs.

When the effect of federal funding of education on gross provincial product is examined, it appears that a positive relationship exists. On this basis, and until there is further evidence to the contrary, it would appear that the federal education grants are justifiable.

ACKNOWLEDGEMENTS

This writer owes a debt of gratitude to a number of people for their assistance with the study.

If it were not for the encouragement and stimulation from faculty members at the University of Windsor and the London School of Economics and Political Science, no study would have been undertaken. In this regard, special thanks are due to Dr. Zbigniew Fallenbuchl and to Dr. Maurice Peston.

At the University of Alberta where the formulation of the dissertation took place, the writer is indebted to many people. Professor John Delehanty, as a member of the supervisory committee, reviewed the early drafts and made many helpful comments. The greatest debt is to Dr. Eric Hanson, who showed much patience and without whose advice and encouragement this study would never have been completed.

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# CHAPTER I

## FEDERAL AID AND EDUCATION

This dissertation is an attempt to justify federal education grants. The data used in justifying federal education grants derive from the experiences of New Brunswick during the period 1945 to 1967. While much attention is given to compiling the actual grants of the period, the chief theoretical concerns are efficiency and growth. For our purposes, efficiency is defined as the degree to which the allocation of grants conform to community preferences, while growth is treated as the increase of output per capita.[1]

Although conditional grants are familiar devices in federal finance, they have been the object of considerable attention and controversy in all federal systems.[2] The

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[1] In this instance, the community preference schedule referred to is that of the province receiving the grant. Although one might wonder at this assumption, it is necessary to determine the welfare implications of policy.

[2] For books dealing with the subject, see A. H. Birch, Federalism, Finance and Social Legislation in Canada, Australia, and the United States (Oxford: Clarendon Press, 1955); G. F. Break, Intergovernmental Fiscal Relations in the United States (Washington: The Brookings Institution, 1967); E. J. Hanson, Australian Commonwealth Grants Commission, Canadian Tax Paper No. 20 (Toronto: Canadian Tax Foundation, 1960); and J. A. Maxwell, The Fiscal Impact of Federalism in the United States (Cambridge: Harvard

concern of economists has been with two aspects of the question, namely, the justification for federal grants, and their conditionality. A principal concern of this inquiry is the justification of federal education grants.

The issue of federal grants has acquired special importance because of the widespread expansion of governmental responsibilities after World War II. Prior to the war, each level of government perceived its own responsibilities as isolated from those of the other levels. However, increasing government responsibility in health, education, welfare, urban planning, consumer protection, stabilization, economic development, regional disparities, the environment, and other policy areas has brought to an end the view that the concerns of each level are fixed, identifiable, and clearly distinct. The ways in which fiscal resources are allocated between levels are not perceived as permanent.

During the post-war period, the governments of Canada began to recognize the importance of education as a generator of economic growth. Recognition of the importance

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University Press, 1946). For Canadian references, see Luella Gettys, The Administration of Canadian Conditional Grants (Chicago: Public Administration Service, 1938); J. F. Graham, Fiscal Adjustment and Economic Development: A Case Study of Nova Scotia (Toronto: University of Toronto Press, 1963); J. A. Maxwell, Federal Subsidies to the Provincial Governments in Canada, Harvard Economic Studies, Vol. LVI (Cambridge: Harvard University Press, 1937); D. V. Smiley, Conditional Grants and Canadian Federalism (Toronto: Canadian Tax Foundation, 1963); and George E. Carter, Canadian Conditional Grants Since World War II (Toronto: Canadian Tax Foundation, 1971).

of education is evidenced in the following quotation: "During the post-war period, it has become increasingly apparent that the future prosperity of a nation will depend in large measure on its success in creating and maintaining an adequate supply of professional, technical, managerial and other highly skilled manpower."[3] Governments, in line with this thinking, dramatically increased their expenditures on education (see Table 1-1). The British North America Act had restricted expenditures on education to the provincial governments.[4] Provincial revenue sources had also been restricted by the BNA Act, and these sources were limited further by the various federal-provincial tax agreements undertaken after 1945. As a result, the vast post-war growth in educational expenditures required considerable federal de facto support.

Education exhibits the characteristics of a "non-private" good in that it generates externalities from the point of view of the individual consumer (student) and the government providing the good (province). Therefore, to ensure optimal levels of expenditure on education, provincial expenditures on spillovers should be compensated.[5]

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[3]Canada, Economic Council of Canada, Economic Goals for Canada to 1970, First Annual Review (Ottawa: Queen's Printer, 1964), p. 160.

[4]Great Britain, Laws, Statutes, etc., British North America Act, 1867, 30-31 Victoria, ch. 3.

[5]This is the topic dealt with in Chapters III and IV. As well, see Carter, Canadian Conditional Grants, and

TABLE 1-1

OPERATING COSTS OF PUBLIC SCHOOL BOARDS, CANADA, SELECTED YEARS, 1954-1967[a] (Millions of Dollars)

| Year | Total Costs |
|---|---|
| 1954 | $ 423.2 |
| 1957 | 606.8 |
| 1960 | 901.3 |
| 1964 | 1,458.1 |
| 1965 | 1,678.6 |
| 1966 | 1,927.5 |
| 1967 | 2,296.3 |

[a]The primary sources--Canada, Dominion Bureau of Statistics, Survey of Elementary and Secondary Education, and Survey of Education Finance--do not contain material prior to 1954. No additional data were available in A Consolidation of Public Finance Statistics.

Source: Canada, Economic Council of Canada, Some Economic Aspects of Provincial Educational Systems, Staff Study No. 27, by J. Cousin, J. P. Fortin and C. J. Wenaas (Ottawa: Information Canada, 1971), p. 200.

New Brunswick was selected as the data base for several important reasons. That province has experienced most of the problems of the "poorer" province in attempting to finance education expenditures. Yet, it has exhibited considerable concern for its educational services, appointing three Royal Commissions on the subject.[6] As a result of

---

Burton A. Weisbrod, External Benefits of Public Education (Princeton: Industrial Relations Section, Department of Economics, Princeton University, 1964).

[6]The two dealing most directly with schools are New Brunswick, Royal Commission on the Financing of Schools, Report (Fredericton: Queen's Printer, 1955), and New Brunswick, Royal Commission on Higher Education, Report (Fredericton: Queen's Printer, 1962). As well, New

the province's commitment and experience, there exists both a body of data and some well-documented conclusions.

There are two other important consequences of the choice of this topic. Since the data published by Statistics Canada are incomplete, a new set of data on federal grants for education has been devised.[7] Secondly, this study contributes to the literature on educational returns in Canada.

## 1. Hypotheses

The analysis of education grants is conducted with the aid of two sets of hypotheses as follows:

1) The amount of spending on education within a given jurisdiction depends on (a) ability to spend, (b) need to spend, and (c) willingness to spend; and

2) economic development is enhanced by an increasing level of education in the population.

The specific reasoning is that federal assistance to education is justified either if there are substantial spillovers decreasing the level of expenditures on education below an

---

Brunswick, Royal Commission on Finance and Municipal Taxation in New Brunswick, Report (Fredericton: Queen's Printer, 1963), deals with some problems of education.

[7]The best statistics available from Statistics Canada are to be found in Survey of Education Finance which has been published annually since 1954. Data prior to 1954 are scattered throughout other publications of Statistics Canada, such as Survey of Elementary and Secondary Education, Survey of Higher Education and the Public Accounts of the Government of Canada. Rather than piece these non-comparable data together, a new definition of education expenditures is developed in Appendix A using original sources.

optimum level and/or if there are benefits in the form of economic development.

When the first set of hypotheses is adapted to take into account spillovers, it becomes possible to consider questions of federal grant policy. Available data precludes consideration of New Brunswick alone and thus the analysis of spillovers is conducted on a cross-sectional basis. The second hypothesis, relating development to educational stock, is examined for New Brunswick.

To date, two types of arguments have been employed in Canada as justifications for federal aid to education, namely, those of an economic nature, and those involving considerations of equity. A number of the benefits of education are national in scope. For instance, the maintenance of international diplomacy depends to some extent on education.[8] An underallocation of resources to education by the provinces would therefore decrease some national benefits. An underallocation by the poorer provinces would also aggravate problems of inequity. The supportive argument holds that such policies would unfairly limit the opportunities available to children raised in poorer regions.

---

[8]Roy E. Moor, "The Federal Government Role in Higher Education," in Economics of Higher Education, ed. by Selma J. Mushkin (Washington, D.C.: U.S. Department of Health, Education and Welfare, Office of Education, 1962). Moor notes that decreased social costs from inefficiencies and illnesses, while basic research which itself has no yield but which provides the basis for subsequent development of useful products, are national benefits of education.

The grants themselves have been subject to numerous problems. Education grants have been the subject of almost unilateral initiation. The result has been poor utilization of the grants, particularly in the first years of operation. As well, the apportionment and matching formulas for the grants have been the subject of much criticism. Economic theory suggests that a higher level of social welfare would have been attainable with unconditional grants.[9]

Lastly, there has been much discussion in the literature as to whether it is better to proceed by developing each province without regard to national growth rates or to develop nationally without concern as to the location of growth. No attempt is made to discuss that question here because such a discussion is usually fruitless, there being arguments for both methods of proceeding.

Of these many issues associated with federal involvement in the educational process, the ones of special concern in this study are spillovers and development.

## 2. Organization

There are many ways of organizing the material which makes up the remainder of the thesis. Most would be valid and most would assist in clarification and elucidation of the findings. The organization chosen here is topical.

---

[9] Wallace E. Oates, Fiscal Federalism (New York: Harcourt, Brace, Jovanovich, Inc., 1972), pp. 75-78. There is an implicit assumption that the provincial community indifference curve best represents welfare.

Chapter II consists of a brief survey of the goals of a federal system of finance. Equity, stabilization, efficiency, and growth are examined in turn. The goals are interconnected and simultaneous achievement of all goals is not always possible. The purpose of Chapter II is to put into perspective the concepts of efficiency and growth, two goals which are the focus of the remainder of the thesis.

Chapter III presents a survey of literature with a view to discovering how responsibilities should be allocated in a federal system. Particular stress is given to such characteristics of the public good as indivisibilities and externalities. As well, there is a discussion of multi-level governments. When the two discussions are coupled, a justification for federal grants is derived.

The first set of hypotheses is tested in Chapter IV on the basis of cross-sectional data for the ten provinces. Per pupil education expenditures are hypothesized to be a function of (a) spillovers measured by migration distributed by education level, (b) federal grants, and (c) enrolment both by level of schooling and as a percentage of population. Because the only data available are those found in the 1961 census, extensive testing of the relationships between the independent variables and the dependent variable is impossible. Even so, a tentative examination of the results seems desirable.

Chapter V provides a review of literature with a view to identifying the contribution to growth made by education. The following four approaches are analyzed: simple correlation, manpower needs, direct returns-to-education, and the residual method. After an examination of the positives and negatives of each, the residual approach is chosen to test the second hypothesis.

In Chapter VI, the second hypothesis is tested. Here, a variation of a Denison-type model is estimated for the Province of New Brunswick. Output in the model is represented by gross provincial product while the inputs are labour, capital, and federal education assistance. Since all variables are most readily available as first differences, they are left in that form so that the parameters represent marginal physical productivities.

Chapter VII, which concludes the study, provides an opportunity to evaluate the policy implications of the results of the study. Because the 1945-67 period is unique as far as conditional grants for education are concerned, the chapter provides an opportunity to establish the attributes of conditional grants.

Two appendices accompany the study. The first contains an historical (1945-1967) compilation of the grants programs administered by the federal government. The second provides a review of some of the demographic, educational, and economic attributes of New Brunswick.

## 3. Definitions

To facilitate communication and understanding, it may be appropriate to elucidate the meaning of some basic terms used in this study. "Federalism," in particular, is a rather elusive term. Wheare has isolated several features common to federal states. He defines these features both in terms of constitutional law and in terms of political relationships. Accordingly, federalism implies that "The general government, like the regional governments, should operate directly upon the people . . . each government should be limited to its own sphere, and, within that sphere, should be independent of the other."[10]

Another conception of federalism holds that federalism exists when institutions, values, attitudes, and patterns of political action operate to give autonomous expression to a national political system and to regional political systems.[11] The autonomy of each of these systems is counterbalanced by mutual interdependence.

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[10] K. C. Wheare, Federal Government (4th ed.; London: Oxford University Press, 1963), p. 14. Later on pp. 18-20 Wheare finds that because the judiciary are appointed federally and because the federal Parliament can prevent the provincial legislature from legislating on provincial subjects, Canada's constitution is quasi-federal while in practice Canada is predominantly federal.

[11] This view is an amalgam of the views expressed by W. S. Livingstone, "A Note on the Nature of Federalism," Political Science Quarterly, LXVII (March, 1952), 83-84, and R. L. Watts, New Federations, Experiments in the Commonwealth (Oxford: Oxford University Press, 1966).

Another view is that of Riker, who interprets federalism in terms of bargaining theory. For Riker, a system is considered to be federal if "(1) two levels of government rule the same land and people, (2) each level has at least one area of action in which it is autonomous, and (3) there is some guarantee (even though merely a statement in the constitution) of the autonomy of each government in its own sphere."[12] Riker's conception of federalism is adopted in this study because of its greater linguistic precision and operational flexibility.

The meaning of education also requires some elucidation. The BNA Act treats education in a narrow sense. In this study, a broader definition seems desirable because spillovers and growth effects arise not only from expenditures on formal schooling but also from expenditures on "on-the-job training" and other similar programs.[13] It is desirable, therefore, to consider education as the "development in knowledge, skill, ability, or character by teaching, training, study, or experience."[14] However, because the

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[12] William H. Riker, Federalism: Origin, Operation, Significance (Boston: Little, Brown and Company, 1964), p. 11.

[13] G. S. Becker, "Investment in Human Capital: A Theoretical Analysis," Journal of Political Economy, LXX, No. 5, Pt. 2, Supplement (October, 1962), 9-49.

[14] Thorndike-Barnhart Comprehensive Desk Dictionary, ed. by Clarence L. Barnhart (Garden City, New York: Doubleday and Company, Inc., 1956), p. 263.

effect of education expenditures by government is examined in this study "education" is used in a limiting way to refer to formalized training programs.

Finally, the reader will note references to "provinces" throughout the study. For our purposes, "province" and "state" carry interchangeable meaning. "Province" is employed with predominant frequency in order to preserve linguistic continuity.

## 4. Conclusion

A study of federal grants can never be complete. There are always changes occurring in both federal-provincial arrangements and actual goals. Because this study examines education grants to the Province of New Brunswick for the years 1945 to 1967, it is constrained in time, in type of grant, as well as in geography. Yet, the questions examined are broad ones, which have become important because of the rapid expansion of government responsibilities and the growing realization of interdependencies in a federal system. This study, hopefully, assists the reader in understanding some of the complexities faced by a federation.

## CHAPTER II

## THE GOALS OF MULTI-LEVEL FINANCE

The decisions and operations of governments must be made and carried out with concern for equity, stabilization, efficiency, and growth. While there is no consensus about a definition of the term "equity," it is normally used to refer to the distribution of income. In any particular society, there is an impression about the desired income distribution, although differences in opinion exist. It is possible for decision makers to perceive the meaning of equity in any given circumstance and economists can then methodologically indicate how economic policy can be used to attain the equity objective. Various types of equity will have differing consequences for the economy.

Stabilization (the attainment of low levels of unemployment simultaneously with little price increase) is a goal to which the attention of the politician and the economist must be turned. Hostility in general public attitudes towards unemployment and price advances may affect voter behaviour. Moreover, failure to attain price stability coincident with low levels of unemployment generates economic problems in many areas, including business financing, balance of payments, and others.

In a perfect market, resource allocation is determined by prices. Since this is not possible for public goods (public good characteristics such as indivisibilities, extreme externalities, and no price exclusion make it impossible to set prices), the neutrality of government policies becomes important as an efficiency norm. Growth, or an increasing output in an economy, remains an important goal.[1]

Public finance cannot always separate these goals in theory or in policy. A given action by government often affects more than one goal, sometimes in a negatively non-neutral way.

Allocating funds to achieve the goals is a difficult problem in any state. Complications arise where there is more than one level of government, constitutionally given exclusive jurisdiction over certain fields while having coordinate jurisdiction over other fields. It is necessary to make adjustments in the theory of the public sector to take into account the division of authority between levels of government.

In the case of Canada, the British North America Act allocates to the provincial governments certain exclusive

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[1] A discussion of the economic goals of a country can be found in Canada, Economic Council of Canada, Economic Goals for Canada to 1970. The Council also includes balance of payments equilibrium and balanced regional development in their goals. R. A. Musgrave, The Theory of Public Finance (New York: McGraw-Hill Book Company, Inc., 1959), p. 5, and Fiscal Systems (New Haven: Yale University Press, 1969), pp. 4-32, divides the government sector into three branches: (1) allocation, (2) distribution, and (3) stabilization and growth. These correspond to the four goals here. Musgrave assumes that each branch is to work independently on the assumption that the other branches perform their respective functions properly. This argument is referred to again in this chapter.

powers, enumerated in Section 92. Section 91 of the BNA Act gives the central government power over "all Matters not coming within the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces,"[2] and then goes on to enumerate certain specific powers. Canada, then, is one of those cases for which an adjustment must be made in the theory of public goods to take account of multi-level governments.

This chapter examines the objectives of federal finance as it is treated in the literature. The goals are considered separately, i.e. when one is considered the remaining goals are assumed to have been established. This is partial equilibrium analysis, while in practical application, all goals must be set simultaneously.[3]

## 1. Equity

Usually, in unitary states, equity discussions refer to the distribution of the burdens and benefits of government finance between the rich and the poor. In recent years, however, the issue of geographical inequality has become as important in the literature as that of personal inequality.

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[2] Great Britain, Laws, Statutes, etc., British North America Act, 1867, 30-31 Victoria, ch. 3.

[3] John G. Head, in his article "Public Goods and Separation of Branches," Public Finance, XXV (1970), 546-55, points out that the separation of branches for setting policy leads to problems in maximizing welfare.

Changes in technology and world demand, the discovery and depletion of natural resources, and the decline of rural society contribute to the constantly changing fortunes of particular geographical areas.[4] Geographically, even small countries, such as Switzerland and Luxembourg, are faced with these regional disparities and in much greater degree so are larger countries.[5]

An examination of geographic equity must be based on an economic region which is homogeneous in at least one important attribute. These attributes might be economic performance, market size, social and cultural features, physical features, and administrative jurisdiction. This study uses provincial boundaries in defining a region, both

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[4]"Geographical distance, of course, is not the only factor favouring the assumption of a degree of independence by the different regions of a country: there are also such factors as local 'mentality', racial structure and others, to be considered. The eastern part of the Republic of Niger may serve to illustrate this point." L. H. Klaassen, Area Economic and Social Redevelopment: Guidelines for Programmes (Paris: Organization for Economic Co-operation and Development, 1965), p. 19.

[5]The cases of Switzerland and Luxembourg are cited by T. N. Brewis, "Regional Economic Disparities and Policies," in L. H. Officer and L. B. Smith, Canadian Economic Problems and Policies (Toronto: McGraw-Hill Company of Canada, 1970), pp. 335-51. Other unitary states have been dealt with in the literature on regional inequities. For a specific study, the reader might refer to H. B. Chenery, "Development Policies for Southern Italy," Quarterly Journal of Economics, LXXVI (November, 1962), 515-47. Several countries, including federal and unitary states, are referred to in an article by J. G. Williamson, "Regional Inequality and the Process of National Development: A Description of the Patterns," Economic Development and Cultural Change, XIII (July, 1965), 1-84.

because these boundaries define administrative units and because statistics are more readily available by province than by other divisions.[6]

The principles of equity which have been advanced in the literature on federal finance can be divided into four basic categories. These principles are referred to as follows: (a) the principle of federation as a family; (b) the principle of derivation; (c) the principle of equalization; and (d) the principle of equalization of the fiscal residuum.

i) The Principle of Federation as a Family

In classical public finance theory, the marginal social benefit (MSB) of an increment of government expenditure is supposed to equal the marginal social cost (MSC), if there is to be an optimum allocation of resources in the economy. This efficiency norm was extended to federal finance by Bhargava who made it a principle of geographical distribution. The national benefit from public expenditures would thus be maximized when:

> Marginal benefit from different items of state expenditure (such as education, public health, law and order, etc., etc.) in state A
> = Marginal benefit from different items of state expenditure in states B, C, D, . . . , etc.
> = Marginal benefit from different items of federal

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[6]Canada, Economic Council of Canada, Towards Sustained and Balanced Economic Growth, Second Annual Review (Ottawa: Queen's Printer, 1965). Much of the literature on federal states refers to geographic equity, using the provincial or state boundary as a reference point.

expenditure (such as defence, civil administration, etc.).[7]

If tastes implied by this decision rule are the same in all regions, the rule amounts to ensuring the same amount of government services and taxes in each province. The result is that more funds have to be spent by the federal government on poorer areas in order that the marginal benefits may be equated in all provinces. This may be done in two ways. The federal government can distribute its direct expenditures in such a way as to equalize the marginal benefits in provinces, or preferably the federal government can give grants to the provinces so that the states themselves could equate marginal benefits.[8]

There are two basic disadvantages of the system advocated by Bhargava. First, the system of grants advocated would require the federation to have a social welfare function to weigh the net fiscal advantages of the various provinces.[9] Secondly, the system does not suggest any practicable method by which marginal benefits can be measured and therefore gives no operational guidance.

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[7] R. N. Bhargava, The Theory and Working of Union Finance in India (London: George Allen and Unwin Ltd., 1956), p. 66.

[8] Ibid.

[9] It is because of this "share-and-share-alike" aspect of the system that it is labelled "federation as a family" in A. D. Scott, "The Economic Goals of Federal Finance," Public Finance, XIX (1964), 257.

ii) The Principle of Derivation

The principle of derivation is based on a simple concept. Basically, it involves dividing federal expenditures into two parts. The first part is direct federal expenditures (on federal functions), while the second part is comprised of payments to the provinces. The latter are to be distributed to the province from which the revenues are raised.

The only redistribution of income is a result of the direct outlays of the federal government. For example, redistribution may be on the basis of the age profile of the provinces (where old age pensions or family allowances are disbursed by the federal government). The nature of the federal programs thus determines the degree and type of redistribution. The principle of derivation does not have much appeal as a means of equalizing incomes in various states partly because there is no deliberate federal equalization.

iii) The Principle of Equalization

There are various plans which fit into the category of equalization grants. Each plan attempts to give grants according to some objective criterion (criteria) of which needs, revenue capacity, quality, and effort are examples. The applications of this principle are numerous in theory

and in practice.[10] Musgrave has analyzed seven plans in which the criteria are mixed.[11] Any of these plans could be applied in varying degrees according to whether the equalization is to be 100 per cent and whether all needs (revenues, etc.) are taken into account.

Objections to the principle of equalization are usually on the basis of the consequences such plans have for the achievement of economic efficiency. The objections in terms of economic efficiency are discussed later, but usually involve mobility of capital and/or labour, or the effects on provincial tax effort and/or accountability.

The principle of equalization is attractive in that the number of measurable criteria available makes it operational.[12] There is also a flexibility to the principle in that the degree of equalization of well-being can be varied according to the number of criteria used in determining the plan to be implemented.

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[10] The first in Canada were in the arrangements for Confederation. See Maxwell, Federal Subsidies.

[11] R. A. Musgrave, "Approaches to a Fiscal Theory of Political Federalism," in Public Finances: Needs, Sources and Utilization, Special Conference Series, National Bureau of Economic Research, Vol. XII (Princeton: Princeton University Press, 1961).

[12] E. J. Hanson, Fiscal Needs of the Canadian Provinces (Toronto: Canadian Tax Foundation, 1961), makes a "pioneering venture" into the possibility of developing measurable criteria for Canada. Part I deals with what the principle of equalization involves while Part II examines the measurement of criteria.

iv) The Principle of Equalization of the Fiscal Residuum

In his article "Federalism and Fiscal Equity" Buchanan proposed a principle which would equalize the fiscal residuum (the difference between taxes and benefits) for people of equal incomes living in different places.[13]

There are two ways in which the fiscal residuum might be equalized. The first would obligate the federal government to establish differing tax rates in each region to take account of the provincial residuum. Although this system preserves provincial autonomy, it might not, in general, be acceptable from administrative (for example, corporation domicile) and from legal-constitutional aspects. Buchanan recognized these problems.[14]

The second way in which the fiscal residuum can be equalized is to make grants to the provinces in order that they might adjust their local taxes and benefits until nation-wide horizontal equity is achieved. Scott objects on the grounds that an individual's fiscal residuum may result from many combinations of taxes and benefits. Having the same fiscal residuum, therefore, does not guarantee that a person will remain on the same indifference curve. He can likely move to a higher or lower indifference curve by

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[13] J. M. Buchanan, "Federalism and Fiscal Equity," American Economic Review, XL (1950), 583-99.

[14] Ibid., pp. 595-96.

moving to another province with the same fiscal residuum but a different tax-expenditure combination.[15]

## 2. Stabilization

By definition, federalism implies that the provincial governments and the central government are individually responsible for their own taxation and spending policies. The result is that both the provinces and the federal government have an important influence on the level of aggregate demand. Given this situation, and that economic instability may be distributed unequally, it becomes obvious that federations must deal with stabilization problems. For convenience, the literature can be divided into fiscal and monetary aspects.

### i) Fiscal Policy

In the literature on fiscal policy in federations, provincial finance has been treated frequently as an untidy sector of the economy. Provincial governments cannot be grouped with the private sector because they do not act on the basis of market motivations nor can they be conveniently lumped with the central government because the provinces take positive but separate initiatives. The initiatives

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[15] Scott, "Economic Goals," p. 255.

that the provinces can take may nullify central stabilization policies.[16]

Since in a federation, the central government can counteract any spending and/or taxing policies of the provinces and the provinces can reduce or negate the aggregate-demand, aggregate-supply policies of the central government, it would be inappropriate to advocate that each government act independently. It is also not satisfactory to advocate centralization, for many provincial expenditures, such as social transfers and public works, may be more appropriately varied and postponed than some federal expenditures such as defence.[17] Although there may be historical reasons to believe that provincial governments do not take account of the macro-economic consequences of their actions, it does not necessarily follow that the provinces are indifferent to the problem.

Coordination of fiscal policies (public expenditure timing, taxation rate changes, expenditure program changes, tax structure changes, debt policies, foreign market operations, transfer and insurance schemes) is, it seems, the most promising hope for the future. Coordination implies

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[16]This was labelled "fiscal perversity" by A. H. Hansen and H. Perloff, Local Finance in the National Economy (New York: W. W. Norton and Company, Inc., 1944).

[17]Scott, "Economic Goals," p. 281.

having a part in the policy-making plans of other governments.[18]

ii) Monetary Policy

Even though monetary policy is used to attempt to increase the stability of the economy, it is generally recognized that "it is difficult to see how there can be a 'regional monetary policy'."[19] The literature on federal finance usually takes this centralization of monetary policy as a given. The problems of implementing regional monetary policies are many, but need not detain us here.[20]

3. Efficiency

Early studies of federal finance were grounded in neoclassical theory where a price system allocated resources

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[18]See J. A. Maxwell, Federal Grants and the Business Cycle (New York: National Bureau of Economic Research, Inc., 1952), for an historical perspective on the lack of coordination in fiscal policy. For information on Canadian efforts at coordination see Queen's University, Institute of Intergovernmental Relations, Report: Intergovernmental Liaison on Fiscal and Economic Matters (Ottawa: Queen's Printer, 1969).

[19]A. K. Cairncross, Economic Development and the Atlantic Provinces (Fredericton: Atlantic Provinces Research Board, 1961), p. 3.

[20]One of the problems is whether regionally-discriminating monetary policies can be instituted when there are political obstacles to such practices by federal lending agencies. There is also the market equilibriating mechanism to take into account.

and the efficiency norm involved "least-price distortion."[21] Typical of these earlier works were those of Buchanan and Scott in which efficiency was defined in terms of GNP measured by market prices of private goods and services.[22]

Buchanan, starting from equity norms, treated efficiency as a secondary concern. It was not until his article "Federal Grants and Resource Allocation" appeared that he directed significant attention to resource allocation. In that article Buchanan comes to the conclusion that:

> Equalizing transfers carried out by the central government designed to relieve the fiscal plight of the low-income states . . . cannot be rejected for efficiency reasons. It has been shown that the allocative effects vary from instance to instance, allowing no universally applicable conclusions to be drawn.[23]

Buchanan's argument has been characterized as a negative one.[24] A properly designed grant program need not distort the provincial allocation of resources. Efficiency is not, therefore, destroyed by equity.

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[21] J. M. Buchanan and R. E. Wagner, "An Efficiency Basis for Federal Fiscal Equalization," in The Analysis of Public Output, ed. by Julius Margolis (New York: Columbia University Press, 1970), p. 140.

[22] Buchanan, "Fiscal Equity"; A. D. Scott, "A Note on Grants in Federal Countries," Economica, XVII (November, 1950), 416-22; J. M. Buchanan, "Federal Grants and Resource Allocation," Journal of Political Economy, LX (June, 1952), 208-17; A. D. Scott, "Federal Grants and Resource Allocation," Journal of Political Economy, LX (December, 1952), 534-36; and J. M. Buchanan, "A Reply," Journal of Political Economy, LX (December, 1952), 536-38.

[23] Buchanan, "Resource Allocation," p. 217.

[24] Buchanan and Wagner, "An Efficiency Basis," p. 141.

Scott, on the other hand, assumed an economy which is not in long-run equilibrium.[25] In his model, transfers are alleged to provide amenities to poor people living in provinces with poor resource endowments. These grants counteract incentives to labour mobility.

Scott starts with the theory that "the intensity of the application of labour to scarce resources should be the same everywhere, in order to maximize production."[26] Since this can only be accomplished when labour is transferred such that the marginal product of labour becomes the same in all places, the grants which work against mobility prevent maximization of national production.

The theory used by Buchanan and Scott does not include reference to public goods which became part of the analytical framework in public finance following two articles by Samuelson in the mid-1950's.[27] It is mainly for this reason that Scott and Buchanan were unable to proceed further in their debate at the time.[28]

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[25]According to Buchanan and Wagner, "An Efficiency Basis," p. 141.

[26]Scott, "Grants in Federal Countries," p. 419.

[27]P. A. Samuelson, "The Pure Theory of Public Expenditure," Review of Economics and Statistics, XXXVI (1954); and "Diagrammatic Exposition of a Theory of Public Expenditure," Review of Economics and Statistics, XXXVII (1955).

[28]Buchanan had suggested in his paper "Federal Grants and Resource Allocation" that some goods such as education would be better supported than would others such as unemployment relief, but this did not have the comprehensiveness of Samuelson's public goods.

Recent contributions to the literature on efficiency in federations have taken into account the theory of public goods. Particularly noteworthy is the use that spillovers (economies and diseconomies of provincial government operations that accrue to other provinces) have had in developing an ideal constitution.[29] The idea is that each community stops short of the socially optimum level of production, depending on the community's estimate of the spillover benefits or costs that will be incurred. Breton, in his article "A Theory of Government Grants," shows that conditional grants from central to lower jurisdictions remedies the shortfall of production.[30] This view is examined in the next chapter.

## 4. Growth

The literature on growth is invariably connected with the other topics reviewed in this chapter. For instance, the Buchanan-Scott debate which has been referred to as dealing with equity and efficiency is really a debate on growth. Buchanan advocates capital movements towards the

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[29] See C. M. Tiebout, "An Economic Theory of Fiscal Decentralization," in Public Finances: Needs, Sources and Utilization, Special Conference Series, National Bureau of Economic Research, Vol. XII (Princeton: Princeton University Press, 1961), pp. 79-96, and "Comments" by B. A. Weisbrod in the same volume, pp. 131-32; and A. Breton, "A Theory of Government Grants," Canadian Journal of Economics and Political Science, XXXI (1965), 175-87.

[30] Breton, "Government Grants."

poorer provinces for education, natural resource exploration, and health, while Scott advocates labour movements away from the poorer provinces to areas where the productivity would be higher. The chief difficulty with Scott's system is that it depends on labour mobility when often one factor leading to a federation (rather than a unitary state) is cultural (which implies immobility of people).[31]

There are some further factors to be considered in a discussion of growth. First, there is an increased tax burden which falls on a "growing" province to support those provinces which are not growing.[32] To balance this effect, federation provides a larger protected market which allows firms to gain from economies of scale. As well, the "spread" effect of grants to the poorer provinces may be greater, in fact, than the equalization payments made by the rich provinces to the poor provinces.[33] The latter benefits may be in the form of increased sales or in a better quality labour force. The net effect is difficult to determine.

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[31] Graham, Fiscal Adjustment.

[32] J. R. Hicks, "The Nature and Basis of Economic Growth," in U. K. Hicks, et al., Federalism and Economic Growth in Underdeveloped Countries (London: George Allen and Unwin Ltd., 1961), p. 79.

[33] B. Higgins, Review of Federalism and Economic Growth in Underdeveloped Countries, by U. K. Hicks, et al., in Pacific Affairs (1963), pp. 460-63.

## 5. Conclusion

It is clear from the foregoing that there are strong connections between the four goals outlined. To achieve one goal, another goal must, at times, be compromised.

This study attempts to justify federal education grants to New Brunswick. If policies are inputs and the goals are the desired outputs, then a partial equilibrium analysis would have one output (for example, growth). If the desired output (the attainment of one goal) is attained by one input (one policy such as education grants), then the policy should not be rejected. In other words, if education grants do stimulate growth, one would accept the policy of education grants until further testing could determine whether other policies might stimulate growth more efficiently.

Education grants assist in the attainment of some goals more than others. For instance, education grants add to federal expenditures only if the federal government does not shift funds from other expenditures. In the whole economy, aggregate demand will be increased by education grants only if they cause an increase in total education expenditures by the federal government, the provinces, the municipalities, private institutions, and individuals. Since stabilization (through fiscal policy) is achieved by shifts in aggregate demand, education grants are not directed at achieving stability.

Spillovers (benefits accruing to individuals outside the government jurisdiction in which the expenditure is made) may infringe upon two goals: distributional equity and allocative efficiency.[34] In the first instance, equity considerations suggest that residents share in the costs in relation to the benefits enjoyed.[35] In the second situation, it is suggested here that marginal benefits should be equated to marginal costs, but spillovers cause marginal social benefits to the nation to be greater than marginal provincial benefits.[36] Expenditures on the activity would then be sub-optimal if marginal provincial benefits are equated to marginal provincial costs. Since allocative inefficiency can be a justification for grants, this question merits further consideration in the next chapter.

Economic development can be a justification for education grants. If education grants can be shown to stimulate growth (defined as the increase in gross provincial product per capita), the case for those grants is supported.[37] This question is examined in more detail in Chapters V and VI.

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[34]The question of whether education exhibits spillovers or not is examined in Chapter III as well as in much of the literature cited there.

[35]Carter, Canadian Conditional Grants, p. 15.

[36]Ibid., p. 12.

[37]Here, the case is for provincial growth. If, in fact, there are spillovers and other provincial growth rates are stimulated, the case is even stronger. There still exists, however, the possibility that other expenditures may be preferable.

The goals of stabilization, equity, growth, and efficiency are examined in this chapter. Each is seen to be interconnected and each is important to the government decision maker. They cannot be separated in practice.[38] This study examines only the goals of allocative efficiency and growth. If either goal is made more easily attainable by education grants, then education grants should not be rejected as a policy without further investigation. Further studies would have to examine the relative efficiency of education grants in attaining the goals, but that is not the topic of this study.

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[38]There has been an important debate as to whether separation of the goals can lead to welfare maximization, as well. This debate starts with the separation of branches by Musgrave, The Theory, pp. 3-41. It continues in P. A. Samuelson, "Pure Theory of Public Expenditure and Taxation," in Public Economics, ed. by J. Margolis and H. Guitton (London: Macmillan, 1969), pp. 98-123; R. A. Musgrave, "Provision for Social Goods," in Public Economics, ed. by J. Margolis and H. Guitton (London: Macmillan, 1969), pp. 124-44. Other contributions to the debate include M. C. McGuire and H. Aaron, "Efficiency and Equity in the Optimal Supply of a Public Good," Review of Economics and Statistics, LI, No. 1 (February, 1969), 31-39; H. M. Hochman, "Professor Head on Equity and Efficiency: Comment and Addendum," Public Finance, XXV, No. 4 (1970), 536-45; M. A. Grove, "On Musgrave's Separation of the Tasks of the Public Household," Western Economic Journal, VIII, No. 3 (September, 1970), 241-45; and Head, "Separation of Branches." Hochman and Head agree that distribution (equity) can be settled within the Paretian framework of the allocation branch which is but one variety of an "acceptable" approach. This would imply that welfare maximization is not achieved by the separation of the branches but rather by integrating the branches. According to McGuire and Aaron this results from the non-revelation of individual preferences for public goods.

# CHAPTER III

## PUBLIC GOODS IN A FEDERATION

Government expenditures, which do much to shape the kind of world that individuals face, received little attention from public finance experts (at least in North America) until the middle fifties.[1] Two articles by Samuelson stimulated economic analysis of public expenditures in terms other than a Keynesian national income sense.[2] Even then, the reality of multi-level governments was not analyzed closely.[3]

In the past fifteen years, however, some principles have been established which provide a framework for this

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[1] A good deal of work had been done in Europe and extracts from some of these contributions by Mazzola, Lindahl, Sax, and Wicksell have been translated into English in R. A. Musgrave and A. T. Peacock, eds., Classics in the Theory of Public Finance (London: Macmillan and Company Limited, 1958).

[2] Samuelson, "The Pure Theory," and "Diagrammatic Exposition."

[3] For examples, see Tiebout, "An Economic Theory"; W. C. Hall, Jr., "Some Welfare Implications of Intergovernmental Fiscal Relations with Special Reference to Grants-in-Aid for Education" (unpublished Ph.D. dissertation, University of Illinois, 1964); Albert Breton, "A Theory of the Demand for Public Goods," Canadian Journal of Economics and Political Science, XXXII (1966); and Breton, "Government Grants."

study. After first establishing the characteristics of a public good, it is proposed that the two basic approaches to examining public expenditures (the individual preference approach and the social preference approach) be scrutinized. It is then possible to make some necessary modifications in the individual preference approach to make it applicable for multi-level governments. Grants can then be examined in terms of economic efficiency.

## 1. Public Goods

> If one starts at any point and place in history--say the United States in 1970--it is clear that the society has decided that there exist certain activities that are legitimately performed by governments. Many activities are by long tradition provided by various levels of government and are paid for by using the police powers of the state to raise funds. Others are left to the private sector. Without wishing to disparage the importance of the debate about the proper dividing line between private and public sectors, the fact is there is a large, relatively stable and broadly uncontroversial governmental "sector" of this economy and of every other economy in the world.[4]

What makes a good subject to public provision? Various explanations have been offered, but one distinctive feature is that they can be consumed by more than one person at the same time without an increase in cost or without excluding others. This is Samuelson's equal consumption requirement that $X_{n+j} = X^{i}_{n+j}$ (where i refers to the

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[4]P. O. Steiner, "The Public Sector and the Public Interest," in Public Expenditures and Policy Analysis, ed. by R. H. Haveman and J. Margolis (Chicago: Markham Publishing Company, 1970), p. 21.

individual, private goods are designated by 1, . . . n and public goods are designated by n+1, . . . n+m).[5]

For instance, it would be difficult to exclude one house (person) from protection against nuclear attack when a country sets up its defence system. In this case, houses (people) A and C receive protection in line with their consumer wants but B cannot be excluded.[6] If A and C want books, however, they can purchase them without B having to do so. In the first example, defence is indivisible, while in the second example, books (private goods) are divisible.

Two further properties are characteristic of public goods. The first of these is externalities, the other being a condition of decreasing costs. Externalities in consumption and/or production are neither necessary nor sufficient to make it a public good.[7] A similar comment could be made about the decreasing cost case.

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[5]Samuelson, "The Pure Theory," p. 387. Cf. E. J. Mishan, "The Postwar Literature on Externalities: An Interpretative Essay," Journal of Economic Literature, IX, No. 1 (March, 1971), 10, where it is pointed out that Samuelson's distinction of a public good is not unambiguous, in the short period.

[6]R. Millward, Public Expenditure Economics (London: McGraw-Hill, 1971), pp. 139-42, points out that this is a case of "automatic joint supply" which allows the public sector to provide the service less expensively than "single" or "separate" supply. Following P. A. Samuelson, "Contrast between Welfare Conditions for Joint Supply and Public Goods," Review of Economics and Statistics, LI, No. 1 (February, 1969), 26-30, Millward shows that if the indivisibilities are not large in relation to market demand, private markets can operate efficiently (e.g., swimming pools and cinemas).

[7]Ralph Turvey, "On Divergencies Between Social Cost and Private Cost," Economica, XXX (1963).

"External economies" is a concept which is used extensively in later parts of the study and a complete understanding of it is necessary. An external economy (diseconomy) is the gain (loss) received by other economic units which emanates from one economic unit initiating or not initiating some action or service for its own usage. For example, suppose that a firm manufacturing steel is made more efficient by the introduction of a new technique. If this new technique also resulted in less air pollution than the old technique, the homes, offices, and manufacturing concerns in the surrounding area would be receiving a benefit which to them is external (based on the assumption that less pollution raises an individual's utility).

It is a logical implication of the model that when an economic unit does not itself realize the full benefit (cost) while at the same time having the full cost (benefit) the activity will not be expanded (contracted) to an optimum level.[8] A profit-maximizing firm would not devote five dollars' worth of resources to produce an output worth four dollars to them, even though the output was worth four dollars to outsiders as well. Thus an expenditure producing eight dollars' worth of output for a five dollar cost would not be made.

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[8]John F. Due, Government Finance: The Economics of the Public Sector (4th ed.; Homewood: Richard D. Irwin, Inc., 1968), p. 9.

Lastly, the consequences of decreasing cost can best be demonstrated by the traditional example of a bridge with a uniform toll to cover average cost in a particular time period. In this example, it is likely that the bridge would not be used to "capacity" and some individuals who would be willing to pay marginal social cost would be excluded by the average cost price. Pareto-efficiency would require lowering the uniform price towards the true marginal social cost of supplying the service to the last user (zero if wear and tear is neglected) and this would result in substantial losses due to decreasing costs.

In a comprehensive article on the subject, Head has shown that externalities and decreasing costs are special cases of Samuelson's public good concept, i.e., "jointness" or "indivisibility."[9] Arrow takes the argument further to show that externalities and indivisibilities are really special cases of market failure which develop from such high transaction costs that markets are no longer worthwhile.[10]

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[9] J. G. Head, "Public Goods and Public Policy," Public Finance, XVII (1962), 197-219.

[10] K. J. Arrow, "Political and Economic Evaluation of Social Effects and Externalities," in The Analysis of Public Output, ed. by J. Margolis (New York: National Bureau of Economic Research, 1970), p. 16. The same argument in identical words can be found in K. J. Arrow, "The Organization of Economic Activity: Issues Pertinent to the Choice of Market Versus Nonmarket Allocation," in Public Expenditures and Policy Analysis, ed. by R. H. Haveman and J. Margolis (Chicago: Markham Publishing Company, 1970), p. 67.

When private markets no longer exist, the state can use its coercive power to economize on transactions costs.

i) An Example: Education

Education is one of many goods which in Canada is supplied publicly, but which does not fit the (Samuelson) polar case of a public good. First, elements of education are divisible. There is evidence of this in the many studies done on rates-of-return to individuals from additional education.[11] Work on the private rates-of-return primarily involves determining a rate of discount by which a present value of the net stream of revenues deriving from a marginal amount of schooling is calculated.

These studies have a potential usefulness which has not been fully explored, but it would appear that this might be an explicit form of a calculation already made (although implicitly) when people decide whether to remain in school or not and what occupation to take up. If there were only individual returns to education, it would be possible to charge for each year of schooling until marginal individual

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[11] Examples are Milton Friedman and Simon Kuznets, Income from Independent Professional Practice (New York: National Bureau of Economic Research, 1945); H. S. Houthakker, "Education and Income," Review of Economics and Statistics, XLI (February, 1959), 24-28; G. S. Becker, Human Capital: A Theoretical and Empirical Analysis, With Special Reference to Education (New York: National Bureau of Economic Research, 1964); and D. Stager, "Monetary Returns to Post-Secondary Education in Ontario" (unpublished Ph.D. dissertation, Princeton University, 1968).

benefits (MIB) equal marginal individual costs (MIC) which would maximize welfare, given that all benefits were individual and all costs were individual.

Not all benefits, however, can be appropriated by the individual for himself. In other words, not all benefits are divisible. Schooling benefits many people other than the student and his family. It benefits the neighbours, who may be affected favourably by the social values developed in children by the schools, and even by the quietness of the neighbourhood during school sessions. Schooling benefits employers who want a trained labour force; and it benefits other employees whose productivity or employment prospects are affected by the level of productivity of the educated people. Society at large is benefitted by education developing the basis for an informed electorate and by tax burdens being affected by the level of welfare payments to educated people.[12] (The implicit assumption here is that education develops the properties of flexibility and adaptability so that welfare subsidies will not be necessary.)

Several aspects of these benefits need to be noted. First, they are indivisible. A quiet neighbourhood is available to all or available to none. An informed electorate cannot be divided. Increased productivity of the

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[12]For a general discussion on this, see the paper by Maurice Peston, "The Theory of Spillovers and Its Connection with Education," Public Finance, XXI (1966), 184-205.

uneducated due to an increase in the education of one worker does not lend itself to division.

These benefits can also be external. Mobility increases the external benefits but they are also present without any mobility. Suppose community A and community B are in the same province but are situated several hundred miles apart. Suppose also that community A has developed a very functional education system while community B has chosen to have no education system. The external benefits received by community B include lower provincial taxes (community A does not require as much provincial welfare and this decreases the total provincial budget) and lower unemployment insurance premiums. It is implicit in this example that each community was sovereign in its education decisions and finance.

In summary then, the benefits of education accrue to individuals (they are divisible) and to society (they are indivisible). Even the indivisible benefits display a quality of diminishing as one moves away geographically. Education, then, is not a pure public good although it does display elements of a public good.[13]

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[13]There is another case for education receiving government assistance or provision. The presence of substantial risk, in the absence of insurance, causes aggregate demand to be deficient. See Marc Nerlove, "On Tuition and the Costs of Higher Education: Prolegomena to a Conceptual Framework," Journal of Political Economy, LXXX, No. 3, Pt. II (May/June, 1972), S186-88.

Is there value in analyzing any other than a pure public good? The answer is yes. Samuelson recognized that a good is quite unlikely to be a polar case of a purely public or a purely private good.[14] Head has pointed out that a given unit of a good, once produced, which can be made partially available to several individuals exhibits "indivisibility" of a less extreme nature than that used previously in this study.[15]

> The presence of public good elements in this sense is quite sufficient to cause the change in the Pareto-optimum conditions and consequent failure in the market catallactics . . . . Modified in this way, the public good concept, and hence the theory of public policy based on it, thus becomes much more realistic and important.[16]

## 2. Social Preference Approach to Resource Allocation

Pigou is responsible for developing in English the principle of proportional satisfaction of public and of private wants.[17] This principle was later restated by Dalton.[18] They were led from this conviction to propose two principles of budgetary policy. First, the marginal returns

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[14]Samuelson, "Diagrammatic Exposition," p. 356.

[15]Head, "Public Goods and Public Policy."

[16]Ibid., p. 203.

[17]A. C. Pigou, A Study in Public Finance (3rd rev. ed.; London: Macmillan and Co. Ltd., 1947), p. 31.

[18]Hugh Dalton, Principles of Public Finance (London: Routledge and Kegan Paul Ltd., 1952), chap. 2.

from various public expenditures should be equalized. Secondly, the satisfaction from the last dollar spent should equal the lost satisfaction from the last dollar of taxes.

To demonstrate these principles, Musgrave has introduced a diagram similar to the one presented below.[19] In Figure 3-1, the line aa shows the marginal utility of successive units of public expenditures, allocated optimally between different public uses. The marginal disutility of successive units of taxes, designed to cause the least total sacrifice, is shown by bb. The line cc measures the net benefits from successive additions to the public budget and is obtained by subtracting bb from aa. The optimum size of the budget is at the point where marginal net benefits are zero (OC).

The one advantage of the Pigou-Dalton approach is that the solution can be derived from community wants and sacrifices without regard to individual benefits and costs. These community wants can expressly include a redistribution of income and merit wants which do not appear in individual preference schedules. There is no dependency on a clear definition of a public good.

This looks more helpful than it actually is. There is still the problem of determining the values to be assigned to the aa and bb curves. Somehow, aa must depend

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[19] Musgrave, The Theory, pp. 114-15.

on the immeasurable social utility of public services while bb must depend on the equally immeasurable social utility foregone by directing resources to the public sector. Furthermore, the principle of equal marginal benefit permits no concrete standard by which the efficiency of various expenditure programs may be determined. Figure 3-1 "offers little more than a pious reminder that the budget should be planned efficiently."[20]

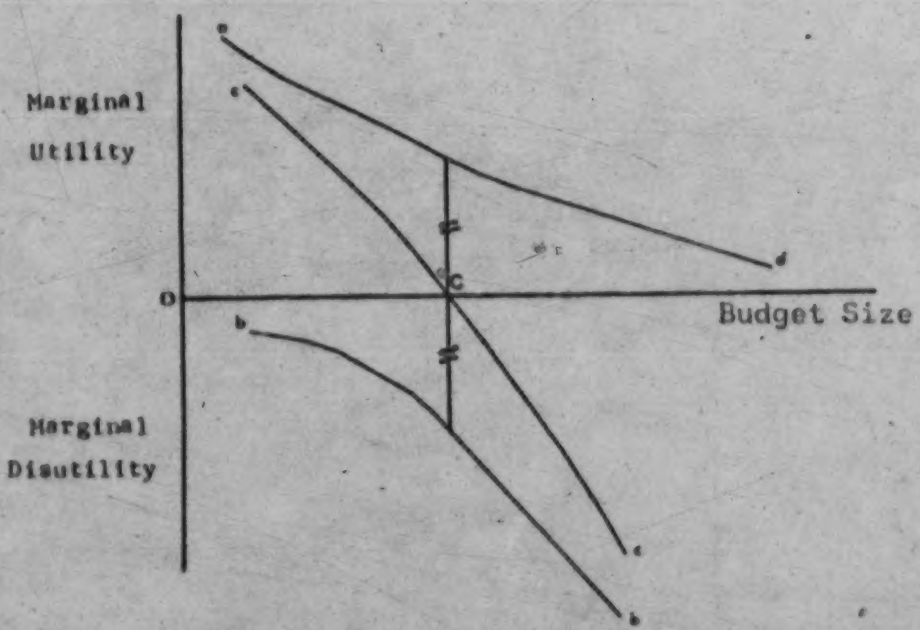


Figure 3-1

PIGOU-DALTON APPROACH TO RESOURCE ALLOCATION

[20]Musgrave, The Theory, p. 115.

This model, requiring a collective mind, has been criticized for another reason. It has been used and is subject to use as a justification for all configurations of government. As a result, "there is perhaps little that an economic theorist can usefully say about it."[21]

### 3. Individual Preference Approach to Resource Allocation

Early work on the determination of public expenditures and taxation by use of individual preferences was framed in terms of partial equilibrium.[22] Samuelson undertook to restate these earlier works in general-equilibrium terms. The general tenor of Samuelson's articles and those of Lindahl preceding him was that of an exchange between an individual and his government. Individual preference schedules were accepted as the proper basis for allocating resources between the production of public goods and services and private goods and services.

In the following figures which are used to show Samuelson's general-equilibrium system, two people are represented by A and B, and two goods are represented by 1 (pure private good) and 2 (pure public good). In Figure 3-2a, individual A's preferences between goods 1 and 2 are

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[21] Samuelson, "Diagrammatic Exposition," p. 350.

[22] See Lindahl's theory translated into English in Musgrave and Peacock, eds., Classics, and Musgrave's criticism of it in Musgrave, The Theory, pp. 78-80.

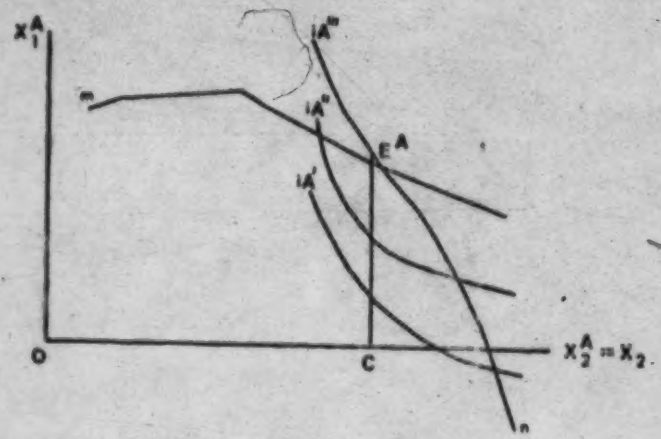


Figure 3-2a

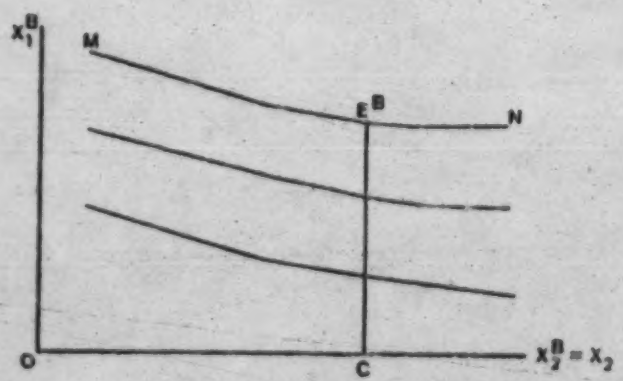


Figure 3-2b

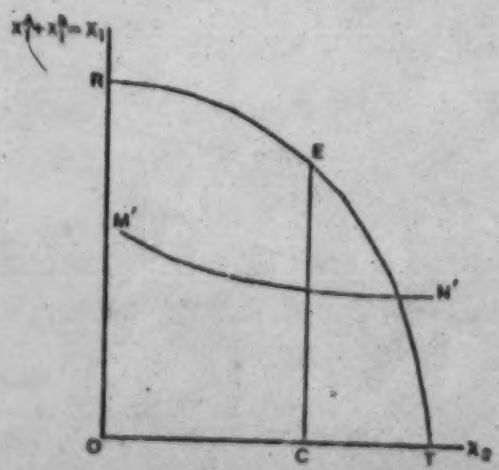


Figure 3-2c

SAMUELSON APPROACH TO RESOURCE ALLOCATION

shown by a standard indifference map. Likewise, in Figure 3-2b, individual B's preferences between the same two goods are shown by indifference curves. Finally, in Figure 3-2c, RT relates the production frontier for the two goods in the usual manner--i.e., with the assumption of increasing relative margiral costs.

In these three figures a special definition of a public good means that they are not independent. Each must have exactly the same horizontal scale. Each and every man must always be at the exact same longitudinal point such that $X_2 = X_2^B = X_2^A$. This restriction is not present for private goods and thus, in Figure 3-2c, the vertical axis is not equal but is the sum of the vertical axes in Figures 3-2a and 3-2b and E must equal $E^A + E^B$.

To locate the ideal state of the world for such a system, it is necessary to choose a parcelling out of the private and public goods which is an ethical, normative question. In following Samuelson on this point, the major need is for a social welfare function that satisfies the condition that "at any point, a move of each man to a higher indifference curve can be found that will increase social welfare."[23]

Diagrammatically, this is done by holding all but one man at specified levels of indifference. In this case

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[23] Samuelson, "Diagrammatic Exposition," p. 352.

man B is held on indifference curve MN (Figure 3-2b). The problem, then, is to find the highest indifference curve that man A can attain given the scarcity demonstrated in Figure 3-2c by RT. MN is copied on Figure 3-2c and is labelled M'N'. The difference between M'N' and RT represents the amounts of the two goods physically available to man A. This difference is demonstrated by the curve mn in Figure 3-2a. $E^A$, where mn just touches the indifference contour $i_A'''$ is the tangency point which makes man A best off.

This solution is thus established by setting an initial indifference curve for man B. There will be a new maximum attainable tangency point for man A for each of the infinite initial indifference curves possible. Thus, there is an infinite number of Pareto-optimal points which cannot be compared without a social welfare function. A move from one Pareto-optimal point to another will always hurt one man while helping another.

i) A Difficulty: Group Wants and Individual Preferences

One difficulty inherent in this analysis has received a great deal of attention in the literature. That is, group wants may not appear in individual preference schedules.[24]

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[24]Among the many works the following could be referred to: K. J. Arrow, Social Choice and Individual Values (2nd ed.; New York: John Wiley and Sons, Inc., 1963), chaps. 5 and 8; H. R. Bowen, Toward Social Economy (New York:

Even if they do appear in the individual's preference schedule, there are difficulties in the political process which allows the revelation of individual preferences for public goods.[25]

Arrow points out that if collective decisions are to be rational in revealing true individual preferences (the effective social welfare function), the following conditions must be met:

1) A unique social ordering must exist regardless of the manner in which individuals in the community order their alternative choices. Social choices must be transitive.

2) The choice of a commodity must not be rejected because some individuals have changed the relative rankings of alternative commodities. The social welfare function must be nonperverse.

3) Ranking in the social welfare function between two alternatives must not be dependent on individuals' rankings of nonrelevant alternatives.

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Rinehart and Co., Inc., 1948); J. M. Buchanan and G. Tullock, The Calculus of Consent (Ann Arbor: The University of Michigan Press, 1962); R. A. Dahl and C. E. Lindblom, Politics, Economics, and Welfare (New York: Harper and Bros., 1953); Anthony Downs, An Economic Theory of Democracy (New York: Harper and Bros., 1957); J. F. Rothenberg, The Measurement of Social Welfare (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1961); and D. M. Winch, "Pareto, Public Goods and Politics," Canadian Journal of Economics, II, No. 4 (November, 1969), 492-508.

[25]See the discussion in Musgrave, The Theory, chap. 6.

4) All alternatives must be permitted a free vote by individuals in the community. Social choices must be non-dictatorial.[26]

In Arrow's recent works, reference is again made to some problems of the political process. Voting on the issue of income distribution is again shown to exhibit intransitivity. He also refers to political policy which is formulated by representatives or agents which leads to the question of how individual preferences are taken into account. Arrow poses these as problems to be faced, not as answered questions.[27]

This study does not pursue these difficulties. The importance of the analysis presented in this study is that public goods in an analogous way to private goods are part of the individual's preferences--there being two differences in the analysis: the multiple Pareto-optima and the lack of a market to set prices.

### 4. Multi-Level Governments

The problem of allocating funds between the private and public sectors is further complicated where there is more than one level of government constitutionally given exclusive jurisdiction over certain fields while having

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[26] Arrow, Social Choice, chap. 3.

[27] Arrow, "Evaluation of Social Effects," pp. 18-20, and Arrow, "The Organization of Economic Activity," pp. 69-71.

coordinate jurisdiction over other fields. In the case of Canada, the British North America Act allocates to the provincial governments certain exclusive powers, enumerated in Section 92. Section 91 of the BNA Act gives the central government power over "all Matters not coming within the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces,"[28] and then goes on to enumerate certain specific powers. Thus Canada is one of those countries for which an adjustment must be made in the theory of public goods to take account of multi-level governments.

The adjustment to be made is in the way public goods are defined. It has already been shown that not all goods are purely public or purely private. It is the use of this knowledge that permits examination of public goods in multi-level governments.

Those goods which exhibit some elements of a public good but are not equally available to all are known as "non-private" goods.[29] Some of these are consumption goods.

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[28]Great Britain, Laws, Statutes, etc., British North America Act, 1867, 30-31 Victoria, ch. 3.

[29]The suggestion that there are many goods which are not polar cases of public goods or private goods can be found in writings by G. Colm, "Comments on Samuelson's Theory of Public Finance," Review of Economics and Statistics, XXXVIII (November, 1956), 408-12; S. Enke, "More on the Misuse of Mathematics in Economics: A Rejoinder," Review of Economics and Statistics, XXXVII (May, 1955), 131-33; J. Margolis, "A Comment on the Pure Theory of Public Expenditure," Review of Economics and Statistics, XXXVII (November, 1955), 347-49; Musgrave, The Theory, pp. 6-15; and P. A. Samuelson, "Aspects of Public Expenditure Theories," Review of Economics and Statistics, XL (November, 1958), 332-38. The clearest use of the idea has been by Breton, "Government Grants," pp. 175-87.

Others are of a geographical nature. In the first case, a standard example would be vaccination against communicable diseases where the level of prevention increases as the number of users increases. In the second case, the nearer the good is to the consumer, the greater the amount available. There are many examples but a standard illustration, sufficient to demonstrate the principle, is fire protection where the objective benefit (in event of fire) decreases as the distance from the fire hall increases.

Breton defines the degree of "publicness" spatially and assumes that many "non-private" goods exhibit similar spatial characteristics. He is then able to label these clusters of goods in descending order of publicness as follows: "international goods, continental goods, national goods, regional goods, provincial goods, metropolitan goods, municipal and local goods."[30]

The same basic ranking can be obtained by using the theory of external economies. Those non-private goods with world-wide external benefits (i.e., an end to bombing by one country) would have a one-to-one correspondence with international goods.

In this system, a perfect mapping is defined as one in which there are no spillovers between jurisdictions--the objective benefits of one type of goods (local) are

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[30]Breton, "Government Grants," p. 178.

exhausted within the boundaries of the jurisdiction providing the good (local). There is only one governmental system that is compatible with perfect mapping and that is one in which there are different levels of authority parallel to the types of non-private goods.

Revenue systems can be justified on two principles--the ability-to-pay approach and the benefit approach.[31] If government revenues are based on the latter (each person pays for the goods used) each government has sufficient taxing powers to comprise its own expenditures since all goods are used within the jurisdictional borders.[32] The literature, however, provides several valid reasons why benefit taxation is a difficult principle to apply. The first and most important difficulty is that every person could benefit by concealing his true preferences. Secondly, the principle implies more weight (in decision making) to the person with the larger quantity of funds. Lastly, it is only a partial equilibrium solution in that it only takes into account the

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[31]These principles have been well covered in the literature. For the benefit approach see Bowen, Toward Social Economy, pp. 176-78, and Musgrave, The Theory, pp. 61-89. For the ability-to-pay approach see Pigou, A Study in Public Finance.

[32]Not necessarily the physical exhaustion of goods, but the benefits derived according to the individual's evaluation.

public sector and ignores the social division between public and private goods.[33]

Most governments, therefore, adopt some variation of the ability-to-pay approach based on an index such as income, wealth or consumption. In multi-level governments, the difficulty with the ability-to-pay principle is in dividing up the taxation base between the various levels of government. As it is impossible to distribute the revenues to correspond exactly to the expenditures, one solution would be to give the broadest-level government all revenues based on ability-to-pay and to have them give to each of the smaller jurisdictions unconditional grants. Under this system, if a smaller jurisdiction (i.e., province) needed more funds, benefit taxation could provide them, alleviating the problem that one jurisdiction (province) may desire more quantity and a greater quality of services than another (province).

The scheme is simple, then, if there is a perfect mapping of jurisdictions, and systems of ability-to-pay and benefit taxation can be derived. Neither condition, however, is evident or possible.

In many cases, the governmental system is discontinuous (there may be spillover effects which carry over

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[33]Bernard P. Herber, Modern Public Finance: The Study of Public Sector Economics (rev. ed.; Homewood, Ill.: Richard D. Irwin, Inc., 1971), p. 68.

into the territory of the contiguous jurisdiction). When this type of discontinuity in government is present, the expenditure should be made by the next higher level of government.[34] If each province has its own preference function which differs from other provincial preference functions and from the federal government's preference function and if provincial sovereignty is important, the expenditure by the next higher level of government is unacceptable.

A pragmatic solution might then be to establish a limited number of governmental levels, each with functions approximating its spatial coverage. In this system, the more senior government would collect taxes on the ability-to-pay principle and give unconditional grants to the more junior levels of government. If there were some junior-level functions with external effects, conditional government grants would yield a Pareto-optimal allocation of resources even if the lower-level governments were using benefit taxation.[35]

The Canadian constitution approximates the pragmatic solution but differs from it in some important aspects. The BNA Act is a fairly rigid constitution which does not allow for the changing nature (including spatial coverage) of functions over time. As well, there is no clear distinction

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[34] Breton, "Government Grants," p. 182.

[35] Ibid., p. 187.

made in Canada as to which level of government uses which principle to collect revenues. In practice, the federal authority tends to use ability-to-pay more than benefit as a principle while the provinces use both. Likewise, the principle of conditional grants in cases of spillovers only is not adhered to. In fact, the federal government often uses conditional grants in establishing its own programs or priorities even when spillovers are insignificant.

### 5. Education: A Conclusion

Earlier in the chapter, it was established that education was a good which demonstrated some of the characteristics of externalities.[36] It was also established that it met some of the characteristics of a "non-private" good. When multi-level governments were discussed, it was seen that goods which exhibited externalities should be provided by a more senior-level government or should be assisted by conditional grants from a more senior-level government. The Canadian constitution bars the federal government from providing education directly (although this has been deviated from in instances[37]) but has not deterred the federal government from using conditional grants to assist education.

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[36] Supra, p. 39.

[37] An example would be Adult Retraining carried out by the Department of Manpower. Other examples would include schools operated by the Department of Defence at military bases and schools for Indians and Eskimoes operated by the Indian Affairs Branch of the Department of Indian Affairs and Northern Development, and Royal Military College operated by the Department of Defence.

# CHAPTER IV

## GEOGRAPHICAL SPILLOVERS AND EDUCATION

In this chapter an attempt is made to investigate the geographical spillovers of education and whether their existence has affected the level of provincial financial support for elementary, secondary, and higher education. The analysis tests the hypothesis that support for education is based on the expectations of net benefits. According to the hypothesis, the existence of spillover benefits to regions outside New Brunswick (or any province) are regarded as losses of potential benefits by decision makers in the province. As a consequence, these spillover benefits would exert some influence on the expenditure per pupil which measures the level of support for public education in a province.[1]

Losses to the province from the emigration of persons educated within the province are essentially of three

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[1]This type of analysis was first carried out by Burton A. Weisbrod in his book External Benefits of Public Education. The same material in slightly different form appeared in Burton A. Weisbrod, "Geographical Spillover Effects and the Allocation of Resources to Education," in The Public Economy of Urban Communities, ed. by Julius Margolis (Baltimore: The Johns Hopkins Press, 1965).

forms.[2] Firstly, the additional lifetime productivity generated by the education may be lost to the province from which the individual is leaving. Secondly, the tax revenues for the province losing the educated would be decreased by some factor times the additional income that would have been generated because of the extra education. Thirdly, there would be a loss to the province of the non-monetary benefits of education such as social norms and values, good citizenship, and so forth.

Demand for education may be differentiated as follows:

1) the demand of the student for knowledge and future earnings;

2) the demand of parents on behalf of their present and future school-age offspring; and

3) the demand for the education of other people's children.

The first two demands are not likely to be diminished by the knowledge that the recipient of the education may eventually leave the province. The willingness of adults to support education (other than the families of students and future students) may be a negative function of the degree to which potential benefits accruing to them from the schooling of other people's children are lost to those outside of the province.[3]

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[2]Peston, "Theory of Spillovers," p. 194.

[3]Weisbrod, "Geographical Spillover Effects," p. 195.

For efficiency of resource allocation and for equity, the implication of these geographic spillovers is that if a province realizes that benefits produced by expenditures on education are captured by persons outside the province, it may fail to undertake expenditures on education that would be desirable from the standpoint of the entire society. The analysis assumes a decision-making unit that tends to equate the marginal costs it bears with the marginal benefits it receives.

Benefit spill-ins, which the province receives from migration into the province, may tend to cancel the spill-outs of out-migration from the province. However, the spill-ins of benefits to the province from education provided outside the province are essentially independent of its own education expenditures. Assuming collective welfare maximization, the spill-ins of benefits to the province constitute fixed benefits which have no influence on decisions at the margin. Thus the tendency of benefit spillovers to cause underexpenditure on education is not offset by a tendency of spill-ins to cause overexpenditure.[4] The consequence is that expenditures on education may be less than optimal unless a higher-level government supports them or the lower-level government is expanded geographically so as to internalize the spillover benefits.[5]

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[4] Ibid.

[5] Breton, "Government Grants."

## 1. Empirical Testing

A linear multiple regression model is used to examine the influences of a number of "independent" variables (including spill-ins and spill-outs) on per pupil education expenditures. The variables included are as follows:

### i) Expenditures Per Pupil: $X_1$

The dependent variable, $X_1$, measures the expenditures per pupil enrolled in non-private elementary, secondary, and post-secondary educational institutions. Expenditures per pupil are established by "decision makers."[6] The decision makers are constrained by the "willingness" of the taxpayers to support them and by the "needs" of the educational system. In other words, the decisions on the level of expenditures are not independent.

Table 4-1 sets out the provincial educational expenditures for the year 1961. Local and provincial

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[6]The decision makers will vary from province to province. In New Brunswick, since the reorganization of the school system recommended by the Royal Commission on Finance and Municipal Taxation in New Brunswick, there have been approximately sixty local school districts, each with a board of school trustees. A provincial Public Schools Commission has a great deal of responsibility including all major financial powers. See New Brunswick, Royal Commission on Finance and Municipal Taxation in New Brunswick, Report, Chapter VIII.

TABLE 4-1

EDUCATION EXPENDITURES BY PROVINCE, 1961-62
(Millions of Dollars)

| Province | Total Expenditures on Elementary and Secondary Education[a] | Federal Contributions Included in (2)[b] | Teacher Training Expenditures[c] | Provincial Expenditures on Higher Education[d] | Provincial Expenditures on Vocational Training[e] | Total Columns (2) to (6)[f] |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Newfoundland | $ 20.5 | $ -0.4 | $0.4 | $ 1.7 | $ 1.2 | $ 23.4 |
| Prince Edward Island | 4.8 | -0.4 | g | 0.7 | 0.2 | 5.3 |
| Nova Scotia | 47.0 | -1.9 | 1.2 | 1.8 | 0.5 | 48.6 |
| New Brunswick | 33.6 | -1.2 | 0.3 | 2.5 | 1.0 | 36.2 |
| Quebec | 383.8 | -5.1 | 8.9 | 65.3 | 15.0 | 467.9 |
| Ontario | 579.9 | -17.2 | 5.4 | 47.4 | 10.0 | 625.5 |
| Manitoba | 70.0 | -5.6 | 0.7 | 6.9 | 0.9 | 72.9 |
| Saskatchewan | 84.6 | -4.5 | 0.6 | 6.4 | 0.8 | 87.9 |
| Alberta | 141.1 | -6.1 | g | 16.4 | 5.5 | 156.9 |
| British Columbia | 141.4 | -5.5 | . . | 11.9 | 1.8 | 149.6 |

[a]Calculated from Canada, Dominion Bureau of Statistics, Survey of Education Finance, 1961 (Ottawa: Queen's Printer, 1964), Table 8, and Survey of Education Finance, 1962 (Ottawa: Queen's Printer, 1965), Table 7. Three-quarters of the 1961 expenditures plus one-quarter of the 1962 expenditures are assumed equal to the amount spent in the 1961-62 fiscal year.

[b]Canada, Dominion Bureau of Statistics, Survey of Education Finance, 1961, Table 4.

[c]Ibid., Table 6.

[d]Ibid., Table 6.

[e]Ibid., Table 18.

[f]Because of rounding the columns do not necessarily add.

[g]Less than significant.

expenditures are included.[7] Federal contributions are excluded. Thus, column (7) of Table 4-1 represents total expenditures on education out of taxes raised within provincial borders and out of funds borrowed outside the provincial boundaries by the provincial or local authorities. The numerator for calculating expenditures per pupil is thus found in column (7).

The denominator in the calculation of current expenditures per pupil is found in column (8) of Table 4-2 which is a summation of the enrolment in public and separate elementary and secondary schools, post-secondary vocational schools, public trade courses for apprenticeship and pre-employment, universities, colleges, and teachers' colleges.[8]

Private institutions are not included in the enrolment and expenditure figures, nor are federal schools for Indians or blind and deaf.[9] The resulting figure for expenditures per pupil represents those expenditures made by provincial and local authorities on pupils registered in institutions largely under the control of these same authorities.

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[7]This ensures that provinces which differ in the division of local and provincial expenditures will be treated in the same manner.

[8]Private expenditure and enrolment data are not included because the model is meant to examine the influences on local and provincial decision makers.

[9]The data for enrolment are tentative as Statistics Canada was unable to get figures for certain types of enrolment for 1961-62. The methods of recording and reporting enrolments quite obviously vary.

TABLE 4-2

ENROLMENT IN PROVINCIALLY-ASSISTED EDUCATIONAL PROGRAMS, 1961-62
(Thousands of Students)

| Province | Public + Separate Elementary + Secondary Schools | Post-Secondary Vocational Education | Pre-Employment Public Trade Courses[a] | Apprenticeship Public Trade Courses | University and College | Teachers Colleges | Total[b] Columns (2) to (7) |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Newfoundland | 133.7 | . . | 0.8 | 0.8 | 1.8 | . . | 137.1 |
| Prince Edward Island | 25.7 | . . | 0.2 | . . | 0.7 | 0.1 | 26.7 |
| Nova Scotia | 186.3 | c | 1.4 | 0.8 | 6.4 | 0.3 | 195.2 |
| New Brunswick | 155.2 | 0.1 | 1.0 | 1.4 | 4.5 | 0.6 | 162.8 |
| Quebec | 1,158.2 | 7.8 | 8.1 | . . | 43.2 | 11.6 | 1,228.9 |
| Ontario | 1,462.2 | 4.0 | 3.6 | 3.3 | 35.9 | 6.1 | 1,515.1 |
| Manitoba | 194.9 | . . | 2.6 | 1.3 | 6.9 | 0.5 | 206.2 |
| Saskatchewan | 215.6 | 0.2 | 2.9 | 0.9 | 6.3 | 1.2 | 227.1 |
| Alberta | 307.7 | 1.0 | 2.8 | 3.8 | 8.5 | . . | 323.8 |
| British Columbia | 341.2 | 0.2 | 2.5 | 3.6 | 14.7 | . . | 362.2 |

[a]"Because of a complete reorganization in the system of recording enrolments and completions in publicly-operated institutions offering trade courses, no figures for the school year 1961-62 are available." Canada, Dominion Bureau of Statistics, Preliminary Statistics of Education, 1963-64 (Ottawa: Queen's Printer, 1964), p. 50. The data in this column are for the year 1960-61, since little change in enrolment is anticipated. Also note, Quebec includes apprentices in this category.

[b]Because of rounding the columns do not necessarily add.

[c]Less than significant.

Source: Canada, Dominion Bureau of Statistics, Preliminary Statistics of Education, 1962-63 (Ottawa: Queen's Printer, 1963), Table I.

TABLE 4-3

PROVINCIAL EXPENDITURE PER PUPIL BY PROVINCE, 1961-62

| Province (1) | Expenditure by Province and Local Government[a] (2) | Enrolment in Public Education[b] (3) | Expenditure Per Pupil[c] (2) ÷ (3) (4) |
|---|---|---|---|
| Newfoundland | $ 23.4 | 137.1 | $171 |
| Prince Edward Island | 5.3 | 26.7 | 199 |
| Nova Scotia | 48.6 | 195.2 | 249 |
| New Brunswick | 36.2 | 162.8 | 222 |
| Quebec | 467.9 | 1,228.9 | 381 |
| Ontario | 625.5 | 1,515.1 | 413 |
| Manitoba | 72.9 | 206.2 | 354 |
| Saskatchewan | 87.9 | 227.1 | 387 |
| Alberta | 156.9 | 323.8 | 485 |
| British Columbia | 149.6 | 362.2 | 413 |

[a]From Table 4-1 expressed in millions of dollars.

[b]From Table 4-2 expressed in thousands of people.

[c]Rounding causes some variation in these figures which are expressed in actual dollars. These are average expenditures per pupil in each province and do not take into account the higher cost of secondary and post-secondary education. Variable $X_4$ introduces the enrolments at the post-elementary level as a separate variable.

ii) Federal Grants for Education as a Percentage of Educational Expenditures Made by the Province: $X_2$

The first independent variable to be considered is federal grants for education as a percentage of provincial expenditures on education. This variable is included so as to determine any systematic relationship between federal grants and the level of expenditures per pupil. A positive sign on the regression coefficient would indicate larger sums of money being spent on education (per pupil) in those provinces in which federal grants are largest. A negative sign would indicate the opposite.

A positive sign could then imply that grants induce expenditures per pupil to rise. On the other hand, it could indicate that the provinces receiving the largest grants (as a percentage of their own expenditures) are those provinces which for some reason are able to afford large educational expenditures or alternatively wish large educational expenditures.

A negative regression coefficient could also be interpreted in more than one way. For instance, it may indicate that the province engages in expenditure switching.[10] Another explanation could be that larger grants are in fact

[10] For instance, Province A which was receiving $5.0 million for education purposes from the federal government may in fact have spent that $5.0 million itself on education. Because the grant is forthcoming, however, they may now spend that $5.0 million on highways.

going to provinces which spend less on education (per pupil), either because they cannot afford to spend more or because of a desire not to spend more.

Table 4-4 establishes the federal contributions, by province, for the year 1961 as a percentage of provincial and local expenditures on education. It will be noted that the percentages vary from 12.13 per cent (for Prince Edward Island) to a low of 3.34 per cent (for Quebec). Quebec rejected some types of grants in 1961.[11]

iii) Percentage of School-Age Population Enrolled in Non-Private Educational Institutions: $X_3$

The percentage of the school-age population enrolled in publicly-supported educational institutions is an indication of the attitudes of the populus towards public education. Parents who disapprove of public education will send their children to private schools and this negative attitude will then show up in this variable. Furthermore, after the school-leaving age (sixteen in most provinces) the percentage of students not continuing to attend schools which are publicly-supported acts as an indicator of negative attitudes towards the public education system. Likewise, the higher the percentage of people in this age group attending

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[11] Several examples are pointed out in Appendix A. They include University Operating Grants and Apprenticeship Training.

TABLE 4-4

FEDERAL CONTRIBUTIONS AS A PERCENTAGE OF PROVINCIAL EDUCATIONAL EXPENDITURES, 1961-62

| Province | Provincial and Local Expenditures[a] | Federal Contributions[b] | Federal Contributions as a Percentage of Provincial and Local Expenditures |
|---|---|---|---|
| Newfoundland | $ 23.4 | $ 1.4 | 6.0 |
| Prince Edward Island | 5.3 | 0.6 | 11.3 |
| Nova Scotia | 48.6 | 4.3 | 8.8 |
| New Brunswick | 36.2 | 2.5 | 6.9 |
| Quebec | 467.9 | 15.1 | 3.2 |
| Ontario | 625.5 | 38.3 | 6.1 |
| Manitoba | 72.9 | 8.2 | 11.2 |
| Saskatchewan | 87.9 | 6.9 | 7.9 |
| Alberta | 156.9 | 9.2 | 5.8 |
| British Columbia | 149.6 | 11.6 | 7.7 |

[a] From Table 4-1.

[b] Canada, Dominion Bureau of Statistics, Survey of Education Finance, 1961 (Ottawa: Queen's Printer, 1964), Table 4. Expressed in thousands of dollars.

public schools is an indication of the "willingness" of people to support the system.

Some difficulty is encountered in deciding the ages which constitute "school-age." Since for most provinces children enrol in kindergarten at age five and school attendance is controlled by law until age fifteen or sixteen, the population aged five to sixteen is relevant. If a student is to complete a four-year university degree beyond senior matriculation (which in Ontario is not granted until the completion of Grade XIII) his graduation would normally come at age twenty-two. Census data on population are available by five-year groupings and for that reason the population base is considered to be composed of five to twenty-four year olds.

Table 4-5 sets out the enrolment and population data and establishes the percentage of five to twenty-four year olds in publicly-supported educational institutions. Quebec has the lowest enrolment as a percentage of the relevant population while Ontario has the highest.

It is expected that the regression coefficient on this variable would be positive. In other words, the greater the enrolment as a percentage of the school-age population, the greater the support being shown for the publicly-operated education system which will then be demonstrated in higher per pupil education expenditures.

TABLE 4-5

PERCENTAGE OF 5-24 YEAR OLDS ENROLLED IN PUBLIC EDUCATION, 1961-62

| Province | Enrolment[a] | Population 5-24 Years Old[b] | Percentage Enrolled |
|---|---|---|---|
| Newfoundland | 137.1 | 197.9 | 69.3 |
| Prince Edward Island | 26.7 | 39.7 | 67.3 |
| Nova Scotia | 195.2 | 278.6 | 70.1 |
| New Brunswick | 162.8 | 239.6 | 67.9 |
| Quebec | 1,228.9 | 2,029.2 | 60.6 |
| Ontario | 1,515.1 | 2,091.4 | 72.4 |
| Manitoba | 206.2 | 322.3 | 64.0 |
| Saskatchewan | 227.1 | 331.0 | 68.6 |
| Alberta | 323.8 | 477.6 | 67.8 |
| British Columbia | 362.2 | 530.2 | 68.3 |

[a]From Table 4-2, column (7).

[b]Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961, Population, Age Groups, Bulletin 1.2-2 (Ottawa: Queen's Printer, 1962), Table 20. Expressed in thousands of people.

iv) Percentage of Total Enrolment Registered in Post-Elementary Education: $X_4$

Secondary schooling is more costly than elementary education (the first eight grades [seven in Quebec]), and post-secondary education in the trades and university is even more expensive. A positive sign is forecast for the coefficient of this variable indicating that the larger the percentage of pupils in the higher educational levels, the larger the anticipated per pupil expenditures on education.

One of the reasons for differences between provinces in this figure is that the age distribution of the children may vary by province. "Need" rather than "attitude" may then be represented by this variable.

In Table 4-6, the enrolment in secondary schools, universities, elementary schools, and other post-secondary institutions can be found. Roughly three-quarters of all enrolment is in elementary schools. Post-secondary enrolment varies from approximately 2 to 5 per cent of total enrolment. The figure used here (the percentage of total enrolment in secondary and post-secondary schools) is found in column (7). There is little difference between the provinces west of the Maritimes, but the enrolment in post-elementary education in the Maritimes is decidedly lower than in the remaining provinces.

TABLE 4-6

ENROLMENT BY LEVELS OF EDUCATION, 1961-62
(Thousands of Students)

| Province (1) | Total Enrolment[a] (2) | Elementary Enrolment[b] (3) | Enrolment in Secondary and Post-Secondary Schools (2) - (3) (4) | Percentage of Total Enrolment in Secondary and Post-Secondary Schools (5) |
|---|---|---|---|---|
| Newfoundland | 137.1 | 112.3 | 24.8 | 18.1 |
| Prince Edward Island | 26.7 | 20.8 | 5.9 | 22.1 |
| Nova Scotia | 195.2 | 153.4 | 41.8 | 21.4 |
| New Brunswick | 162.8 | 126.6 | 36.2 | 22.2 |
| Quebec | 1,228.9 | 904.7 | 324.2 | 26.4 |
| Ontario | 1,515.1 | 1,143.5 | 371.6 | 24.5 |
| Manitoba | 206.2 | 150.5 | 55.7 | 27.0 |
| Saskatchewan | 227.1 | 167.7 | 59.4 | 26.2 |
| Alberta | 323.8 | 236.3 | 87.5 | 27.0 |
| British Columbia | 362.2 | 258.4 | 103.8 | 28.7 |

[a]From Table 4-2, column (7).

[b]Canada, Dominion Bureau of Statistics, Survey of Elementary and Secondary Education, 1961-62 (Ottawa: Queen's Printer, 1962), Table 1-02. Includes all students up to Grade VIII plus those in Junior Auxiliary Classes except in Quebec where Grade VIII is included with secondary enrolment.

v) Population Change with Elementary-Level Education or Less: $X_5$

The percentage change in the population resulting from the net migration of people with elementary-level education or less should affect attitudes towards educational expenditures. For instance, out-migration of people with ar elementary-level of education results in a decrease in expected community benefits. In-migration results in an increase in expected benefits. Decision makers would then be expected to not spend as much per pupil in areas where out-migration is taking place and to spend more per pupil ir areas where in-migration takes place. The predicted sign for the coefficient is thus positive.

Table 4-7 sets out the number of movers over fifteer years of age who moved into and out of each province between 1956 and 1961. This figure as a percentage of the total population over fifteen years of age can also be found in Table 4-7. The available data only take account of the place of residence on June 1, 1956 and June 1, 1961. Some people could have left a province and returned without being counted as movers, while others could have moved several times and would be shown as having moved once.

Total population by province, aged fifteen years and over in 1961, is used as the denominator in making percentage calculations. The resulting percentage depicts the degree of mobility as it appears to the decision makers.

TABLE 4-7

MIGRATION BY PROVINCE AND SCHOOLING FOR THOSE 15 YEARS AND OVER, 1956-1961[a]

| Province | Population Over 15 Yrs.[b] (000's) | Movers[c] | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Elementary | | | | Secondary | | | | Post-Secondary | | | | Total | | | |
| | | In | | Out | | In | | Out | | In | | Out | | In | | Out | |
| | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) |
| Newfoundland | 266.3 | 900 | 0.34 | 1,845 | 0.69 | 2,445 | 0.92 | 4,840 | 1.82 | 710 | 0.27 | 955 | 0.36 | 4,055 | 1.52 | 7,640 | 2.87 |
| Prince Edward Island | 66.9 | 805 | 1.20 | 1,040 | 1.55 | 2,040 | 3.05 | 2,730 | 4.08 | 410 | 0.61 | 595 | 0.89 | 3,255 | 4.87 | 4,365 | 6.52 |
| Nova Scotia | 480.7 | 3,085 | 0.64 | 6,280 | 1.31 | 11,370 | 2.37 | 18,035 | 3.75 | 2,500 | 0.52 | 3,965 | 0.82 | 16,955 | 3.53 | 28,280 | 5.88 |
| New Brunswick | 370.7 | 4,260 | 1.15 | 6,285 | 1.70 | 9,045 | 2.44 | 12,515 | 3.38 | 2,025 | 0.55 | 2,575 | 0.69 | 15,330 | 4.14 | 21,375 | 5.77 |
| Quebec | 3,395.9 | 9,970 | 0.29 | 14,080 | 0.41 | 28,480 | 0.84 | 28,790 | 0.85 | 9,295 | 0.27 | 9,140 | 0.27 | 47,745 | 1.41 | 51,910 | 1.53 |
| Ontario | 4,253.3 | 27,180 | 0.64 | 16,520 | 0.39 | 61,000 | 1.44 | 52,475 | 1.24 | 14,955 | 0.35 | 14,465 | 0.34 | 103,135 | 2.44 | 83,460 | 1.97 |
| Manitoba | 621.6 | 5,770 | 0.93 | 8,665 | 1.39 | 19,305 | 3.11 | 25,760 | 4.31 | 4,450 | 0.72 | 5,415 | 0.87 | 29,525 | 4.75 | 40,840 | 6.57 |
| Saskatchewan | 610.4 | 5,475 | 0.90 | 12,205 | 2.00 | 14,590 | 2.39 | 29,870 | 4.89 | 3,250 | 0.53 | 6,665 | 1.09 | 23,315 | 3.82 | 48,740 | 7.98 |
| Alberta | 862.7 | 12,455 | 1.44 | 9,520 | 1.10 | 37,670 | 4.37 | 30,545 | 3.54 | 7,980 | 0.93 | 6,515 | 0.76 | 58,105 | 6.74 | 46,580 | 5.40 |
| British Columbia | 1,119.9 | 14,075 | 1.25 | 8,855 | 0.79 | 40,260 | 3.59 | 24,790 | 2.21 | 8,530 | 0.76 | 6,080 | 0.54 | 62,865 | 5.61 | 39,685 | 3.54 |

[a]Migration is defined as a different province of residence on June 1, 1961 than on June 1, 1956. Some people could have left a province and returned without being counted as movers, while others could have moved several times and would be shown as having moved once.

[b]Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer, 1962), Population, Age Groups, Table 20.

[c]Canada, Statistics Canada, Census Division, "1961 Basic Migration Table No. 19 (unpublished table prepared at Statistics Canada for research purposes only).

vi) Population Change with Secondary-Level Education: $X_6$

The variable, $X_6$, is the percentage of net movement in population with secondary-school education. No distinctions are made between those who have completed high school and those who have completed only a part.

The comments which can be made about this variable are identical to the previous one. The expected sign on the regression coefficient is the same as for $X_5$. Table 4-7 contains the relevant numbers and percentages for variable $X_6$.

vii) Population Change with Post-Secondary Education: $X_7$

The percentage change in the population resulting from net migration of people with some university or university graduation is found in variable $X_7$. Data for this variable appear in Table 4-7.

The comments for the previous two variables are applicable to this variable as well. One would expect that the higher the level of education, the more significant the loss of benefits and, therefore, the greater the influence on educational expenditures.

viii) Percentage Change in Population Resulting from Net Migration: $X_8$

The percentage change in population resulting from net migration without taking into account the educational

attainment is designated as $X_8$. Data for this variable are found in Table 4-7.

It is expected that if a province is losing any population, it considers it to be a loss of human capital and for this reason would tend to invest less in human capital. The expected sign for this variable is positive.[12]

## 2. The Data

In this statistical test, the data used are those for the Canadian provinces in 1961, except that the migration data covers the period June 1, 1956 to June 1, 1961. There are various attributes of the data of which the reader should be aware.

It will be noted in Table 4-8 that Statistics Canada data are used exclusively. In Appendix A, federal contributions to New Brunswick are calculated on an annual basis, but for this regression the New Brunswick figure has to correspond to the other data available.

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[12] Several previous econometric studies of determinants of education expenditures have included variations of the variables $X_2$ through $X_4$. These include: Jerry Miner, Social and Economic Factors in Spending for Public Education (Syracuse: Syracuse University Press, 1963); Edward Renshaw, "A Note on the Expenditure Effect of State Aid to Education," Journal of Political Economy, LXVIII (April, 1960), 170-74; Sherman Shapiro, "Some Socioeconomic Determinants of Expenditures for Education: Southern and Other States Compared," Comparative Education Review, VI (October, 1962), 160-66; Werner Hirsch, Analysis of Rising Costs of Public Education, Study Paper No. 4, Joint Economic Committee, U.S. Congress (Washington, D.C.: Government Printing Office, 1959), pp. 30-32, 35-37; and Weisbrod, External Benefits, pp. 100-16. The latter study includes a migration variable.

TABLE 4-8

CROSS-SECTIONAL DATA USED IN REGRESSION ANALYSIS

| Province | Expenditure Per Pupil $(X_1)^a$ | Federal Contribution as a Percentage of Total Expenditures $(X_2)^b$ | Percentage of 5-24 Year Olds Enroled in Public Education $(X_3)^c$ | Percentage of Total Enrolment in Secondary and Post-Secondary Schools $(X_4)^d$ |
|---|---|---|---|---|
| Newfoundland | $171 | 6.0 | 69.3 | 18.1 |
| Prince Edward Island | 199 | 11.3 | 67.3 | 22.1 |
| Nova Scotia | 249 | 8.8 | 70.1 | 21.4 |
| New Brunswick | 222 | 6.9 | 67.9 | 22.2 |
| Quebec | 381 | 3.2 | 60.6 | 26.4 |
| Ontario | 413 | 6.1 | 72.4 | 24.5 |
| Manitoba | 354 | 11.2 | 64.0 | 27.0 |
| Saskatchewan | 387 | 7.9 | 68.6 | 26.2 |
| Alberta | 485 | 5.8 | 67.8 | 27.0 |
| British Columbia | 413 | 7.7 | 68.3 | 28.7 |
| Mean | $327 | 7.5 | 67.6 | 24.4 |
| Standard Deviation | $108 | 2.5 | 3.3 | 3.3 |

TABLE 4-8--Continued

| Province | Net Migration With Elementary Education as a Percentage of 1956 Population ($X_5$)[e] | Net Migration With Secondary Education as a Percentage of 1956 Population ($X_6$)[f] | Net Migration With Post-Secondary Education as a Percentage of 1956 Population ($X_7$)[g] | Net Migration as a Percentage of 1956 Population ($X_8$)[h] |
|---|---|---|---|---|
| Newfoundland | -0.35 | -0.90 | -0.09 | -1.35 |
| Prince Edward Island | -0.35 | -1.03 | -0.28 | -1.65 |
| Nova Scotia | -0.67 | -1.38 | -0.30 | -2.35 |
| New Brunswick | -0.55 | -0.94 | -0.14 | -1.63 |
| Quebec | -0.12 | -0.01 | -0.00 | -0.12 |
| Ontario | +0.25 | +0.20 | +0.01 | +0.47 |
| Manitoba | -0.46 | -1.20 | -0.15 | -1.82 |
| Saskatchewan | -1.10 | -2.50 | -0.56 | -4.16 |
| Alberta | +0.34 | +0.83 | +0.17 | +1.34 |
| British Columbia | +0.46 | +1.38 | +0.22 | +2.07 |
| Mean | -0.26 | -0.56 | -0.12 | -0.92 |
| Standard Deviation | 0.49 | 1.15 | 0.24 | 1.86 |

TABLE 4-8--Continued

[a] Table 4-3.

[b] Table 4-4.

[c] Table 4-5.

[d] Table 4-6.

[e] Table 4-7, column (5) - column (3).

[f] Table 4-7, column (9) - column (7).

[g] Table 4-7, column (13) - column (11).

[h] Differs from addition of $X_5$, $X_6$, and $X_7$ in that rounding has been done.

Comparable data for the Northwest Territories and Yukon would have been desirable, but it would not have increased the reliability of the statistical estimations significantly. The data available, however, are insufficient to include either territory in the regression analysis.

### 3. The Results

The welfare-maximization model predicts that in a multiple regression analysis in which other determinants of public education expenditures are held constant, the coefficient of variables 5, 6, and 7, net migration by the three levels of schooling will be significantly positive. That is, assuming a continuation of the 1956-61 migration pattern, those provinces which anticipate out-migration will have expenditures per pupil lower than otherwise expected.

As well, the coefficients of variables 3 and 4, the percentage of 5-24 year olds enrolled, and the percentage of pupils enrolled in post-elementary schools respectively, would be significantly positive. That is, assuming that the community's demand for education is represented by the percentage of 5-24 year olds enrolled in publicly-supported education, those provinces with a greater demand for education would have higher expenditures per pupil than would otherwise be expected. Likewise, if the "need" for more funds is represented by the percentage of those enrolled who are at the post-elemeotary level, then those provinces with greater

"need" would have higher expenditures per pupil than would otherwise be expected.

The regression equation obtained was as follows:[13]

$$X_1 = -1025.91 - \underset{(5.82)}{16.18}\ X_2 + \underset{(4.93)}{9.48}\ X_3 + \underset{(4.84)}{34.30}\ X_4 + \underset{(143.80)}{182.74}\ X_5 - \underset{(64.70)}{124.05}\ X_6 + \underset{(247.11)}{199.77}\ X_7$$

The standard errors are in parentheses. The coefficient of $X_2$ about which there was no a priori expectation is negative and significant at the 5 per cent level.[14] Above, two possible reasons for a negative regression coefficient are suggested.[15] It is difficult to say whether provinces actually do engage in expenditure switching or whether the largest grants go to those provinces which spend smaller amounts on education per capita. Both explanations are plausible. The latter has some appeal to people who wish to continue the federal role as an educational granting agency.

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[13] The coefficient of multiple determination, $R^2$, is 0.96 and the adjusted coefficient, $\bar{R}^2$, is 0.89. The F statistic is 12.56 which is significant at better than the 5 per cent level. The coefficients of partial determination are as follows:

$Y^2_{21.34567} = -0.85$ $\quad$ $Y^2_{51.23467} = 0.59$

$Y^2_{31.24567} = 0.74$ $\quad$ $Y^2_{61.23457} = -0.74$

$Y^2_{41.23567} = 0.97$ $\quad$ $Y^2_{71.23456} = 0.42$

[14] Using a two-tail t-test. The two-tail test is necessary since the sign of the coefficient had not been predicted.

[15] Supra, p. 63.

The variables $X_3$ and $X_4$ both have the expected sign and are significant at better than the 10 per cent and 1/2 of 1 per cent level respectively.[16]

Attention can now be turned to the coefficients of the variables $X_5$ to $X_7$. The signs of the coefficients for $X_5$ and $X_7$ are as predicted but are not statistically significant. The sign of the coefficient for $X_6$ is not as predicted, nor is it significant at better than the 20 per cent level.[17] This suggests that decision makers are not influenced to change per capita education expenditures by observed migration patterns.[18]

One of the problems with determining statistical significance in the above regression analysis is the lack of degrees of freedom. By doing the regression analysis with only one migration variable, the degrees of freedom are increased in number. Thus, a new variable ($X_8$) represents the percentage change in population resulting from net migration. The hypothesis is that decision makers take into account out-migration when expenditures per pupil are set, regardless of how well educated the out-migrants are. The

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[16]Using a single-tail t-test. The single-tail test is appropriate since the signs of the coefficients had been predicted.

[17]Using a two-tail t-test.

[18]Attention is drawn to T. H. Wonnacott and R. J. Wonnacott, Introductory Statistics (New York: John Wiley and Sons, Inc., 1969), p. 179, where it is suggested that with a small sample (this case), judgment is best suspended.

regression equation obtained with this change was:[19]

$$X_1 = -993.03 - \underset{(6.37)}{13.53}\ X_2 + \underset{(4.81)}{9.47}\ X_3 + \underset{(5.22)}{32.03}\ X_4 - \underset{(9.39)}{1.20}\ X_8$$

This time the coefficients of $X_3$ and $X_4$ are significant at close to the 10 per cent level and better than the 1/2 of 1 per cent level respectively. The coefficient for $X_2$ is again negative and significant at the 10 per cent level. The coefficient of $X_8$ is not significantly different from zero.

## 4. Discussion and Conclusions

The results of the regressions that have been run point in one direction. The most significant variable in the determination of per pupil education expenditures in Canada is the "need" variable, percentage enrolment in post-elementary schools. The other variable that seems consistently significant is the percentage of 5-24 year olds enrolled in public education. Both variables measure an attitude towards education although the percentage enrolment in post-elementary schools may also be determined by age distribution. If these variables do, in fact, measure

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[19] The coefficient of multiple determination, $R^2$, is 0.91 and the adjusted coefficient, $\bar{R}^2$, is 0.85. The F statistic is 13.44 which is significant at better than the 1 per cent level. The coefficients of partial determination are:

$$\gamma^2_{21.348} = -0.69 \qquad \gamma^2_{41.238} = 0.94$$

$$\gamma^2_{31.248} = 0.66 \qquad \gamma^2_{81.234} = -0.06$$

attitude, the coefficients suggest that positive attitudes will be expressed in higher per capita education expenditures.

The migration variables do not seem to be significant in the determination of per pupil educational expenditures. That might suggest that education decision makers are influenced by some force, other than rates-of-return.[20] This conclusion does not correspond to the results of the study done by Weisbrod where the coefficient of in-migration proved to be not significantly different from zero, while the coefficient of the out-migration variable was negative and significant at the 1 per cent level.[21] The value of the out-migration coefficient in Weisbrod's results showed that for a one point increase in the percentage of the population net out-migrating, there was an associated $4.04 decrease in per pupil education expenditures.[22]

There might be several explanations for the fact that an expected net out-migration of population might have no effect on decision makers in Canada. There have been

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[20]The terms "seems" and "might" are used in line with the fact that judgment is best suspended because of the sample size.

[21]Weisbrod, External Benefits, p. 111.

[22]An attempt was made to estimate Weisbrod's regression (without racial distinction) with Canadian data but the F-level or tolerance-level was insufficient for the computer to complete the estimation of all of the coefficients. This was because of the fact that there were only ten observations for each variable.

attempts in Canada to make the educational system consistent between provinces in terms of school-leaving age and even curriculum. Some of this consistency is a result of the active co-operation of the provinces through periodical ministerial-level meetings and through provincial standards which allow very little local autonomy. In Canada, as well, a larger percentage of school funds come from the senior (federal and provincial) governments than in the United States (55 per cent as opposed to 46 per cent).[23] For these reasons, local decision makers (including provincial education officials) have less power to vary expenditures according to expected rates-of-return than would their counterpart in the United States.

The coefficient for federal grants has already been referred to.[24] Again, there might be a reason for its negative sign and its seeming significance.[25] The Canadian federal government tends to standardize its grant programs so that they are equally available to all provinces. This takes away the incentive for decision makers to vary

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[23]These figures were taken for the year 1963-64 from Canada, Dominion Bureau of Statistics, Survey of Education Finance, 1964 (Ottawa: Queen's Printer, 1968), p. 7, and K. A. Simon and W. V. Grant, Digest of Educational Statistics, U.S. Department of Health, Education, and Welfare, Office of Education (Washington, D.C.: Government Printing Office, 1967), Table 21.

[24]Supra, p. 78.

[25]The reader is again reminded that judgment is best suspended because of the sample size.

programs which would cause expenditures per pupil to vary. Weisbrod found the coefficient for this variable to be not significantly different from zero and suggests that federal grants might not be considered an incentive nor a disincentive to (U.S.) state education expenditures.[26] This view would lend credence to the idea that grants are being given to those jurisdictions that can least afford education expenditures (i.e., grants do not cause more or less spending on education).

Before this discussion is concluded, it is necessary to refer to the statistical difficulties associated with the study. First, there are only ten provinces which means that a cross-sectional study suffers from a small number of observations, relative to the number of variables. One way to overcome this would be to run a combination of time-series and cross-sectional studies but in this study migration data are unavailable on a time-series basis. Secondly, Statistics Canada was kind enough to release their unpublished migration tables, but both they and this writer are aware of the rather significant problems of using these. Because these data were based on a statistical sample disaggregated by age, education, and province of residence in 1961, some cells have so few observations as to be unreliable.

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[26] Weisbrod, External Benefits, p. 111. The results were similar.

The data on expenditures per pupil must be considered tentative. To maintain consistency, Statistics Canada data are used. These suffer from being incomplete.[27] Also, Statistics Canada admits that because of recording changes, enrolment data are incomplete for 1961-62.[28]

In spite of the statistical difficulties, the results are remarkably similar to studies done elsewhere. The desirability of further data collection and testing is clear.

There are two further items to consider in concluding. The reader is reminded that education expenditures are made as part of a political process involving voters, their representatives and bureaucrats.[29] Throughout this chapter references are made to decision makers. Who are these decision makers and to whom are they responsible? From province to province the decision process and institutional arrangements vary. All provinces are consistent, however, in that they seem to be involved to some extent in the control of both expenditures and revenues. All provinces have some form of elected boards at the local level but the degree of autonomy varies. In Ontario these boards are free to establish

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[27] Data for New Brunswick are compiled in Appendix A.

[28] Supra, p. 61.

[29] One might refer here to R. N. McKean, Public Spending (New York: McGraw-Hill Book Company, 1968), pp. 19-25, for a discussion of the political process as an "unseen hand."

salary scales and local property taxes (collected by the municipality) while in New Brunswick, all costs are paid for by the provincial government.[30]

It would appear, then, that the basic decision-making unit in Canada is the province. The federal government is involved in education but has little direct control. The control of the federal government evolves from its influence on provincial decision makers through conditional grants. The provincial ministers of education do meet on a regular basis, as do civil servants, to make common decisions but the province still maintains its autonomy in decision making.

The decision making which does take place has been referred to above as taking place within the political system. Alice Rivlin suggests that decisions with respect to education have, in the past, been oriented towards "availability" of education.[31] She suggests that the problem has only recently become one of "efficiency" and that decision makers are faced with trying to measure benefits and costs of particular social actions "which are much harder to identify and to measure, though no less important than the

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[30]For a recent description of the institutional arrangements, see Canadian Tax Foundation, Provincial and Municipal Finances, 1971 (Toronto: Canadian Tax Foundation, 1971), chap. 8, which appeared bi-annually prior to 1971 as Provincial Finances.

[31]Alice M. Rivlin, Systematic Thinking for Social Action (Washington: The Brookings Institution, 1971).

private benefits."[32] This chapter attempts to measure the various influences felt by the decision makers in determining per pupil expenditures.

Finally, this chapter deals with migration, an area which has been largely neglected in the literature. Schultz suggests that this neglect may be because policy has been of a laissez-faire nature.[33] Whatever the cause of neglect, this study suggests that education decision makers are not influenced by the migration of those with higher education when per pupil expenditures are established.

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[32] Ibid., p. 59.

[33] T. W. Schultz, ed., Human Resources, Fiftieth Anniversary Colloquium VI (New York: National Bureau of Economic Research, 1972), p. 47. Schultz goes on to point out that no matter how efficient private decisions may be, they will not necessarily be socially efficient. Also, he suggests, decisions are not truly laissez-faire because public expenditure on schooling has strong measurable effects on migration.

# CHAPTER V

## EDUCATION AND GROWTH

A variety of approaches have been employed in attempts to assess the economic contribution of education in various studies. These have been characterized as the following:

1) the simple correlation approach;
2) the manpower needs (planning) approach;
3) the returns-to-education approach; and
4) the residual approach.

Each of these methods of evaluation of the contribution of education to development has its own advantages and disadvantages. In this chapter, each approach is examined in turn.

### 1. Simple Correlation Approach

A number of studies have undertaken to correlate educational expenditures, education levels of the labour force, or enrolment ratios (students per unit population) with gross national product per capita over time. Similar studies have undertaken cross-sectional analysis at one point in time for a number of countries. Other studies have been cross-sectional but on an industry or firm basis.

The intertemporal variant of this approach consists of correlating education and GNP within a given country over time. Both Schultz and Harris have made correlations of this kind.[1]

Attempts at intertemporal correlations highlight two problems which plague the approach. First, there is a question of what cause and effect relationship is involved in the education-GNP correlation. A positive correlation may support the view that spending money on education is an important way of raising a country's GNP. The same correlation could also be viewed as evidence of education being a consumer good on which more is spent as GNP increases.

The second problem is present in any analysis involving time series. Education is an investment and presumably stays with the student for most of his life. The analyst must, therefore, decide whether a time-lag is appropriate and how it should be weighted.[2]

Inter-country correlations at a fixed point in time have shown that there is a positive relationship between

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[1] T. W. Schultz, "Education and Economic Growth," in Social Forces Influencing American Education, ed. by N. B. Henry (Chicago: University of Chicago Press, 1961), and Seymour Harris, The Market for College Graduates (Cambridge: Harvard University Press, 1949), especially pp. 160-65.

[2] It has been suggested that younger persons or those who have recently acquired their education should be more heavily weighted. See Schultz, "Education and Economic Growth," p. 66.

education and GNP/capita.[3] These studies point out the educational efforts of one country in relation to what is being done elsewhere. The construction of meaningful inter-country comparisons is plagued with practical problems.

Beside the cause and effect problem which has already been referred to, there are problems in obtaining comparable GNP figures and finding comparable indices of educational activity. If, for the latter, expenditure data are used, there is the added problem that equal expenditures imply equal output only if the efficiency of the two or more systems is the same.

The third variant of the simple correlation approach is that of inter-industry or inter-firm correlations. The advantage of this variant is that the two-way causation problem is not so serious as it was in inter-country or inter-temporal correlations. Firms are not usually considered to be "consuming" education in the way that individuals do.

There are problems associated with inter-industry correlations. Differences in geographical location,

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[3] C. Myers and F. Harbison, in Education, Manpower and Economic Growth: Strategies for Human Resource Development (New York: McGraw-Hill Book Company, 1963), find that there is a very high positive correlation of .88 between a composite index of human resource development and GNP per capita expressed in U.S. dollars. See p. 40 of their book. The trend is confirmed by I. Svennilson, F. Edding, and L. Elvin in "Targets for Education in Europe in 1970," Policy Conference on Economic Growth and Investment in Education (Paris: Organization for Economic Co-operation and Development, 1962), pp. 15-112.

differences in technology, and differences in market-power may be reflected in both the educational levels of employees and the profitability of the industry. Inter-firm correlations are less inclined to be affected by these problems but are not completely free of them.

All three variants of the simple correlation approach involve a number of problems which have been discussed above. Further research may help to eliminate some of the problems. The variant most favoured in the literature for future prospects is inter-firm correlation within one industry.[4]

## 2. Manpower Needs Approach

The objective of "forecasting" manpower needs is to provide educational planners and potential students with information as to the likely needs for persons with various kinds of training. A number of methods for forecasting manpower requirements have been tried.

The manpower needs approach is not strictly a method of examining the effect of education on economic growth but

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[4]The reason is that inter-firm comparisons may be useful in the context of broader manpower development plans in that the need for educated people in the future may become evident. See William G. Bowen, "Assessing the Economic Contribution of Education: An Appraisal of Alternative Approaches," in Economic Aspects of Higher Education, ed. by Seymour E. Harris (Paris: Organization for Economic Co-operation and Development, 1964), p. 181, and Bruce W. Wilkinson, Studies in the Economics of Education, Occasional Paper No. 4 (Ottawa: Department of Labour, Economics and Research Branch, 1965), p. 31.

it is viewed by some people as being a means of overcoming bottlenecks which hinder economic growth.[5] In developed countries, the emphasis is on accelerating or continuing past levels of growth while in underdeveloped countries, the emphasis has been on developing a domestic labour force capable of utilizing the various physical and economic resources available to that country.

There are five distinct methods used by manpower forecasters as follows:

1) employer surveys;

2) projecting present manpower ratios;

3) comparisons with more developed countries;

4) ILOR-trend method; and

5) Meciterranean Regional Project method.

The employer survey method is direct. It asks that employers specify the numbers of persons with specified kinds of qualifications they will require at a certain point of time in the future.[6]

Projecting ratios of trained manpower to employment into the future can take into account demographic information,

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[5]Mark Blaug, An Introduction to the Economics of Education (London: Allen Lane, The Penguin Press, 1970), p. 141.

[6]C. A. Moser and P. R. G. Layard, "Estimating the Need for Qualified Manpower in Britain," in Economics of Education, ed. by Mark Blaug, I (Harmondsworth: Penguin Books, 1968), 303.

expected shifts in the relative importance of various industry groups, and past changes in the ratios.[7]

Some educational planners undertake to examine the present ratios between skilled manpower and the total work force in countries at more advanced stages of development on the assumption that a capital/trained manpower ratio in the advanced country is the causal force in determination of national income.[8]

The ILOR-trend method (incremental labour-output ratio) forecasts the future demand for each occupational group by extrapolating a linear regression of the numbers in a particular occupation on national income. To accomplish this in a reliable manner, time series indicating output per man cross-classified by sector, occupation, and educational qualification must be available.[9]

The Mediterranean Regional Project (an OECD project to produce educational plans for Portugal, Spain, Italy, Greece, Yugoslavia, and Turkey) proceeded in stages. The project first established a target GNP and broke it down by major sectors. The second step involved applying average

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[7] Ibid., pp. 297-99.

[8] W. H. Knowles, "Manpower and Education in Puerto Rico," in Manpower and Education: Country Studies in Economic Development, ed. by F. Harbison and C. A. Myers (New York: McGraw-Hill Book Company, 1965).

[9] P. De Wolff, "Employment Forecasting Techniques in the Netherlands," in Employment Forecasting (Paris: Organization for Economic Co-operation and Development, 1963).

labour-output ratios to the GNP targets in each sector, yielding labour requirement forecasts by sector. The latter were then distributed among a number of occupational categories. The next step was to allow for persons leaving occupations due to death, retirement, and emigration. The final result was a forecast of the demand for educated people conditional on achievement of the GNP target.[10]

The manpower needs approach has the advantage that it offers definite guidelines framed in the terms in which decisions are actually made. This advantage is balanced by several difficulties with the approach. As mentioned earlier, the approach is meaningless unless some relationship between the benefits of having a particular number of trained persons and the costs involved in having them. Secondly, manpower projections to date have not foreseen the implications of new scientific developments and have failed to take account of the elasticity of substitution between capital and labour and between highly-trained manpower and less-highly-trained manpower.[11]

### 3. The Returns-to-Education Approach

There are two basic orientations in the literature on direct returns-to-education. These are the personal

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[10] H. S. Parnes, Forecasting Educational Needs for Economic and Social Development (Paris: Organization for Economic Co-operation and Development, 1962).

[11] Bowen, "Assessing the Contribution of Education," pp. 198-99.

profit orientation and the national productivity orientation. Although the personal profit orientation (differences in net earnings of people with varying amounts of education being evidence of the financial gain associated with attainment of education) is interesting, it is not relevant to a discussion of the effect education has on a province's development. The personal profit orientation represents the added profitability of the individual to an employer. A province may capture some of this through taxation but netting taxes out can handle this problem. What is important to note is that it is a personal motive for education, not one on which public decisions hinge.

The national productivity orientation looks at education-related earnings differentials as partial evidence of the effect of education on the output of the province (country), based on the premise that differences in earnings reflect differences in productivity. It is this orientation which is of interest in this study.

To list the problems associated with the approach makes the case against using direct returns-to-education significant. There are, however, valid reasons for pursuing the topic further.

The first criticism which has been made is that analysts attribute to education results which are partly caused by differences in intelligence, ambition, family connections, and so on. Attempts have been made to overcome

this problem but the efforts, to date, have been less than entirely satisfactory.[12]

Another problem associated with the approach is the link between relative wages and marginal productivities. This link may not be present if firms are not profit maximizers, if the salary structure is rigid by tradition, if the non-monetary attractions vary from one type of work to another, or if collective power in certain sectors influences relative earnings.[13]

External economies are not accounted for in the direct returns-to-education approach. These external economies could include a better-informed electorate, culturally alive neighbourhoods, healthier and less crime-prone populations, and so on. It is not impossible to have external costs, as well, although it is difficult to know of what orders of magnitude they are.[14]

Lastly, this approach projects rates-of-return based on the average rates for past periods. Renshaw and others have seen this as a difficulty because additional investment

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[12]Gary Becker, "Underinvestment in College Education," American Economic Review, L (May, 1960), 346-54, and the comments on the success of these attempts in Bowen, "Assessing the Contribution of Education," p. 186.

[13]For a discussion of these difficulties, see Bowen, "Assessing the Contribution of Education," pp. 186-88 and 190.

[14]M. Perlman, "Theory of Spillovers," pp. 184-205, includes a complete review of spillovers.

is apt to have a smaller rate-of-return by virtue of the law of diminishing returns.[15] Miller and Becker, however, have shown that the rates-of-return have been roughly constant over time.[16]

At this point, attention will be shifted to three advantages of this approach. First, direct rates-of-return can be calculated for individual groups (males, females, racial origins, and so on). Secondly, useful information for allocating resources is provided, because educational benefits are related to educational costs. Lastly, and perhaps most significantly, this approach is susceptible to refinements.[17]

4. Residual Approach

A great deal of literature has been published in the last decade on the residual approach to measuring the contribution of education to the output of a country. The

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[15] E. F. Renshaw, "Estimating the Returns to Education," Review of Economics and Statistics, XLII (August, 1960), 318-24.

[16] H. P. Miller, "Annual and Lifetime Income in Relation to Education: 1935-1959," American Economic Review, L (December, 1960), 962-86, and Becker, "Underinvestment in Education," pp. 346-54.

[17] Bowen, "Assessing the Contribution of Education," pp. 184 and 197. Schultz, ed., Human Resources, p. 34, suggests that "the interdependency of the various parts of the economy and the critical attributes of capital must become integral parts of such investigations (extending knowledge about rates-of-return)." Parentheses mine.

best-known study is probably that of Denison in which he estimates that 23 per cent of the total growth of national product in the United States from 1929 to 1957 could be attributed to improvements in the quality of the labour force of which education was the most significant factor.[18] Other contributors to the approach have included Kendrick, Abramovitz, and Solow.[19]

The basic methodology used in the residual approach is to identify as much as possible of the total increase in economic outputs with measurable inputs, the usual ones being capital and labour. This leaves some of the increase

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[18] E. F. Denison, The Sources of Economic Growth in the United States and the Alternatives Before Us, Supplementary Paper No. 13 (New York: Committee for Economic Development, 1962), p. 267.

[19] John W. Kendrick, "Productivity Trends: Capital and Labour," Review of Economics and Statistics, XXXVII (August, 1956), 248-57, uses weighted real input units to find output given standard efficiency which is less than actual output. The conclusion is that productivity gains accounted for more than half of the 3.3 per cent average rate of growth in real product. Moses Abramovitz, in "Resource and Output Trends in the United States since 1870," American Economic Review, Papers and Proceedings, XLVI (May, 1956), 5-23, uses a similar method to find that cumulated inputs only allows a 14 per cent increase in national product per capita while actually national product per capita had quadrupled during the time period. He attributed the differences to changes in productivity and specifically mentioned education. Robert M. Solow, in "Technical Change and the Aggregate Production Function," Review of Economics and Statistics, XXXIX (August, 1957), 312-20, segregates shifts of the production function from movements along it. By using his method, he finds output per man-hour doubled over the 1909-49 time period and 87-1/2 per cent could be attributed to technical change, the remaining 12-1/2 per cent being attributable to increased use of capital.

in economic output (the residual) attributable to unspecified inputs. Education and technical change are probably the most important of the unspecified inputs.

The Cobb-Douglas production function has been the usual basic model used. With constant returns to scale, it is usually written as:

$$O_t = A_t L_t^b K_t^{1-b} \qquad (5\text{-}1)$$

where $O_t$ is potential gross national product in year $t$, $L_t$ and $K_t$ are potential labour and capital inputs respectively. In year $t$, $A_t$ is an index of total factor productivity, and b and (1-b) are the elasticities of output with respect to labour and capital respectively.

By taking logarithms, differentiating, and assuming neutral technological change (b constant), the relative rate of growth of output is as follows:

$$\Delta O/O = \Delta A/A + b\,(\Delta L/L) + (1-b)\,(\Delta K/K) \qquad (5\text{-}2)$$

where $\Delta O/O$ is the rate of growth of gross national product, and $\Delta K/K$ and $\Delta L/L$ are the relative rates of growth of capital and labour inputs.[20] That part of the growth in output that cannot be explained by the growth of capital and labour inputs is measured by $\Delta A/A$ or the relative rate of growth of total factor productivity.

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[20] This type of analysis was suggested by Richard R. Nelson, "Aggregate Production Functions and Medium-Range Growth Projections," American Economic Review, LIV (September, 1964), 575-606.

Denison can be interpreted as having introduced into the model an average labour quality variable such that:[21]

$$O_t = A_t^* E_t^b K_t^{1-b} \qquad (5\text{-}3)$$

where $E_t = L_t q_t$, $q_t$ being the index of quality, and $A_t^*$ being a narrower concept of total factor productivity (as compared to $A_t$ in Equation 5-1).[22]

If $\Delta q/q$ is designated by $\lambda q$, $\Delta E/E = \Delta L/L + \lambda q$ and the Denison variation of the Cobb-Douglas production function becomes:

$$O/O = \Delta A^*/A^* + b\lambda q + b\,(\Delta L/L) + (1-b)\,(\Delta K/K) \qquad (5\text{-}4)$$

In this formulation $\Delta A^*/A^* + b\lambda q$ is the relative rate of

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[21] The reader is reminded that Denison dealt with capital as well but for the purposes of this discussion, only the labour quality factor has been examined. Nelson deals with the complete Denison system which could be written:

$$O_t = A_t' Q_t^b J_t^{1-b}$$

where $Q_t$ is the same as $E_t$, $J_t$ is a quality-weighted number of machines with new machines given greater weight than old machines, and $A_t'$ is an even narrower concept of total factor productivity than $A^*$. The differentiated equation after logarithms have been taken would read:

$$\Delta O/O = \Delta A'/A' + b\lambda q + (1-b)\,\lambda k - (1-b)\,\lambda k \Delta \bar{a} + b\Delta L/L + (1-b)\,\Delta K/K$$

when $\Delta J/J = \Delta K/K + \lambda k - \lambda k \Delta \bar{a}$, where $\lambda k$ is the percentage per year improvement in the quality of new machines and $\bar{a}$ is the average age of capital.

[22] For a recent discussion of $q_t$, the quality index, see Zvi Griliches, "Notes on the Role of Education in Production Functions and Growth Accounting," in Education, Income, and Human Capital, ed. by W. Lee Hansen, Studies in Income and Wealth, XXXV (New York: National Bureau of Economic Research, 1970), pp. 81-83. Griliches notes that the education variables in this form are "significant" at conventional statistical levels. His study included U. S. Agriculture (two data samples) and U. S. Manufacturing (two data samples).

growth of factor productivity. Improvements not "embodied" in labour inputs (for example, improvements in management practices) are represented by $\Delta A^*/A^*$. The relative rate of improvement in the average quality of the labour force is $\lambda q$.

According to Nelson, Denison's $\lambda q$ is defined in terms of the average quality of all labour and does not strictly deal with improvements in educational standards which principally affect new entrants to the work force. Denison also includes the changing age-sex composition of the work force and the decrease in the average work week as part of the changing quality of labour. The largest of these three factors was in the education level of the work force, which accounted for approximately 70 per cent of the total relative change in labour quality.[23]

## 5. In Conclusion

Four major methods of examining the contribution of education to economic development have been examined in this chapter. Each method is beset by various problems but these difficulties have been associated more with techniques rather than the method itself. For the simple correlation approach the problems appear to be in the measurement of the variables and in the determination of cause and effect.

The problem with the manpower planning approach is its inability, to date, to relate benefits to costs and to

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[23] Nelson, "Aggregate Production Functions," p. 589, Table 5.

take into account elasticities of substitution. In the returns-to-education approach, difficulties arise in attributing to education the returns which ought to be attributed to other things such as ambition. There are also problems in accounting for externalities, relating salaries to marginal productivity, and assuming constant returns. Lastly, the residual approach involves assuming neutral technological change and it also involves difficult measurement problems.

The problems, outlined here, can be overcome in various ways. The purpose of this chapter, however, is to demonstrate the various possible methods of measuring the economic growth attributable to federal grants for the Province of New Brunswick. The residual approach would appear to be useful for this purpose.[24] It associates increased production with standard inputs into the production process. Federal funding for education is an input into the production process and can be associated with increased production.[25] It is, therefore, the residual approach that will be used in the next chapter to test the effect of education grants on the development of New Brunswick.

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[24]Schultz, ed., Human Resources, p. 67, examines the ability of production functions with education as a variable to give meaningful answers to the role which education plays in growth. He finds that these production function studies are indeed useful.

[25]There are of course other reasons for government funding of education. See supra, p. , for a discussion of how education exhibits externalities as well as risks in the absence of insurance. The case for government funding is made in Nerlove, "Costs of Higher Education," pp. S202-12.

# CHAPTER VI

## EDUCATION AND NEW BRUNSWICK DEVELOPMENT

The purpose of this chapter is to examine empirically the development of New Brunswick in the light of concepts developed in the last chapter. An attempt is made to make quantitative statements about the effect of labour, capital, and federal education grants on the development of New Brunswick.

### 1. Denison's Model

In the last chapter, under the discussion of the residual approach to determine the effect of education on the development of an economy, a simplified version of Denison (Equation 5-4) was presented.[1] This equation would appear to lend itself to estimation and, therefore, quantitative statements about the probable effects of education should be possible.

In attempting to analyze the economy of New Brunswick, however, certain problems become evident. First, data on gross provincial product, labour stock, capital stock, and labour quality are necessary. Gross provincial product is estimated for the years 1945-67 inclusive in Table B-21,

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[1] Supra, p. 99.

Appendix B.[2] Labour stock can be estimated for New Brunswick on an annual basis.[3] The labour force data are in index form with the two different base years of 1949 and 1961. The indices overlap at 1961 which permits calculation of actual labour force figures back to 1946. Only one actual figure was available and that was for 124.1 = 86,772 on the 1961 base.

Capital stock presents more of a problem, and so does any calculation of labour quality. Neither has been dealt with in official statistics.

To calculate a capital stock requires a great deal of background data, most of which are unavailable.[4] To

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[2] Infra, p. 247.

[3] These are calculated from Canada, Dominion Bureau of Statistics, Labour Division, Employment and Average Weekly Wages and Salaries (Ottawa: Queen's Printer, various years, 1946-67), and Canada, Dominion Bureau of Statistics, Labour Division, Selected Series of Canadian Labour Statistics, 1954 (Ottawa: Queen's Printer, 1956). For the intervening years Canada, Dominion Bureau of Statistics, Canadian Statistical Review: Supplement (Ottawa: Queen's Printer, various years, 1946-67), provides the necessary data.

[4] See Canada, Royal Commission on Canada's Economic Prospects, Output, Labour and Capital in the Canadian Economy, ed. by William C. Hood and Anthony Scott (Ottawa: Queen's Printer, 1957), particularly chap. 6; K. Buckley, Capital Formation in Canada, Studies in Income and Wealth, Vol. XIX (New York: National Bureau of Economic Research, 1957); and E. H. Phelps-Brown and S. J. Handfield-Jones, "The Climacteric of the 1890's: A Study in the Expanding Economy," Oxford Economic Papers, IV (October, 1952), 266-307. The basic requirement is for a series of investment expenditure figures and an estimate of the service lives of assets that are used by various industries. For Canada, investment data are provided by Department of Trade and Commerce and Dominion Bureau of Statistics, Private and Public

approximate Denison's labour quality for New Brunswick would require calculation of the distribution of individuals by the number of years of schooling completed in order to isolate the effects of schooling, measured in years, on average income, which then could be further refined to take account of changes in the number of days of school attendance during the year.[5] For Canada, equivalent data are lacking.[6]

It is not intended that much effort be given to deriving methods of estimation for capital stock and labour quality. The purpose of this chapter is to carry out a statistical analysis of federal education grants and growth. This can be done directly through the use of a linear regression analysis using annual figures (time series). This is one variant of the correlation approach analyzed by Bowen.[7]

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Investment in Canada, 1926-1951 (Ottawa: Queen's Printer, 1951), and in annual publications entitled Outlook for subsequent years. From 1950, provincial data have been included with Outlook (the 1950 publication includes material back to 1948).

[5]Denison, The Sources, p. 70.

[6]The Census in 1951 did not determine educational attainment but rather determined the number of years of schooling including failed years. Because of the difference between this and the 1961 Census which dealt with grade or education completed, it becomes a matter of estimating the distribution of individuals by education level completed. Gordon W. Bertram, in The Contribution of Education to Economic Growth, Staff Study No. 12, Economic Council of Canada (Ottawa: Queen's Printer, 1966), Appendix A, made arbitrary assumptions as to the distribution of individuals by education levels--an exercise for which he has been criticized and one which becomes even more difficult for one province.

[7]Bowen, "Assessing the Contribution of Education," p. 179.

## 2. The Model

A linear regression model with three independent variables and one dependent variable is used to relate federal education grants to New Brunswick with New Brunswick output. By using first differences, the estimate of the regression coefficient is the marginal physical product. For instance, the parameter for the variable $\Delta C$ is $\frac{\delta O}{\delta C}$ which is the marginal physical product of the capital.

The variables are as follows:

i) Change in Output: $\Delta O$

The change in output is given by the increment in gross provincial product from year t to year t + 1. It is dependent on the various inputs into the production process, some of which are measurable and are included in the formulation of a production function used in this chapter.

Output data are found in Table B-21.[8] The data are in current dollars by year and represent total output. The first differences are shown in column (2) of Table 6-2.

ii) Change in the Employed Labour Force: $\Delta L$

The change in the employed labour force ($\Delta L$) is included as a variable to permit an examination of the hypothesis that a change in the quantity of employed labour has an effect on the increment in output. An increment in the

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[8] Infra, p. 247.

labour force is expected to result in an increment in output. The regression coefficient will have an expected sign which is positive.

iii) Change in Capital Stock: $\Delta C$

Increments in capital stock are hypothesized to affect increments in output positively. This is another way of saying that the regression coefficient (marginal physical productivity of capital) is expected to be positive.

The change in capital stock is gross investment in New Brunswick less depreciation in New Brunswick. The calculation of the change in capital stock is found in Table 6-1.

The data for New Brunswick investment in 1946 and 1947, which appear in Table 6-1, are estimated by simple linear regression.[9] Although it would have been preferable to have had actual data for these two years, the estimated data appear reasonable for use in the regression model. The tentativeness of the regression coefficients is increased, however, by use of estimated rather than actual data.

Table 6-1 also contains an estimation of depreciation for New Brunswick. On the assumption that depreciation is related to investment, New Brunswick's depreciation

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[9] The regression equation in this instance is:

$$I = \underset{(25.41)}{58.35} + \underset{(1.85)}{15.92}\, t$$

where I is investment and t is time. This is significant at better than the 1/2 of 1 per cent level.

TABLE 6-1

CAPITAL STOCK CHANGES, NEW BRUNSWICK, 1946-1967

| Year | Gross Investment[a] (millions) | Canada Depreciation[b] (millions) | New Brunswick Depreciation[c] (millions) | Change in Capital Stock[d] (millions) |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 1946 | $ 74.3 | $1,071 | $ 24.6 | $ 49.7 |
| 1947 | 90.2 | 1,301 | 29.9 | 60.3 |
| 1948 | 128.2 | 1,504 | 34.6 | 93.6 |
| 1949 | 143.5 | 1,731 | 39.8 | 104.1 |
| 1950 | 170.9 | 1,960 | 45.1 | 125.8 |
| 1951 | 178.7 | 2,300 | 52.9 | 125.8 |
| 1952 | 170.7 | 2,537 | 58.4 | 112.3 |
| 1953 | 175.7 | 2,844 | 65.4 | 110.3 |
| 1954 | 181.6 | 3,146 | 72.4 | 109.2 |
| 1955 | 228.4 | 3,527 | 81.1 | 147.3 |
| 1956 | 249.4 | 4,020 | 92.5 | 156.9 |
| 1957 | 226.3 | 4,387 | 100.9 | 125.4 |
| 1958 | 246.0 | 4,381 | 100.8 | 145.2 |
| 1959 | 274.7 | 4,723 | 108.6 | 166.1 |
| 1960 | 254.8 | 5,036 | 115.8 | 139.0 |
| 1961 | 247.9 | 5,182 | 119.2 | 128.7 |
| 1962 | 250.5 | 5,594 | 128.7 | 121.8 |
| 1963 | 270.4 | 5,948 | 136.8 | 133.6 |
| 1964 | 343.7 | 6,328 | 145.5 | 198.2 |
| 1965 | 427.9 | 6,800 | 156.4 | 271.5 |
| 1966 | 490.5 | 7,414 | 170.5 | 320.0 |
| 1967 | 486.6 | 7,896 | 181.6 | 305.0 |

[a]Canada, Department of Trade and Commerce and Dominion Bureau of Statistics, Private and Public Investment in Canada, Outlook (Ottawa: Queen's Printer, various years, 1950-67). For 1946 and 1947, the data are estimated by linear regression.

[b]Canada, Dominion Bureau of Statistics, National Income and Expenditure Division, System of National Accounts: National Income and Expenditure Accounts, 1926-1968 (Ottawa: Bureau of Statistics, 1969), Table A.

[c]Canadian Total Depreciation

$$\times \frac{\text{Investment New Brunswick 1957-1967}}{\text{Investment Canada 1957-1967}}$$

[d]Column (2) minus column (4).

is estimated to be in the same proportion to Canada's depreciation as New Brunswick's investment is to Canada's investment. Depreciation figures by province are not provided by Statistics Canada, and New Brunswick does not calculate depreciation data for its own purposes.

iv) Change in Education Stock Attributable to Federal Grants for Educational Purposes: $\Delta E$

A simple production function assumes an increase in the (constant-quality) quantity of the inputs labour and capital. In the last chapter, it was indicated that education may change the quality of labour in the production process. The change in education stock, then, is an indirect input which positively affects output by increasing labour quality. A positive sign on the regression coefficient is therefore anticipated.[10]

Since first differences are used for the other variables in the model, this variable is in the same form. The change in education stock attributable to federal grants for educational purposes is approximated by the flow of funds from the federal government for education purposes.

Because changes in the education stock enter the production process as changes in the quality of the labour force, there is a time lag before changes in the education stock affect output. The time lag is related to the length

[10] For an example see Griliches, "Notes," pp. 85-86.

of time between the investment in education and the entrance of that education into the labour force. While some of the federal grant programs anticipate an immediate entry into the labour force, others anticipate several years before there is entry into the labour force. Thus, for our purposes, a one-year lag appears to be appropriate.[11] Data for the variable are found in Table 6-2.

### 3. Data

In a statistical test of this model, data were gathered on an annual basis for the years 1946 to 1967 inclusive. Because the statistical test deals with first differences, there are twenty-one valid cases in the computations (two of which involve estimated data).

The change in the labour force is the only variable which has negative observations. Just because the changes in output, capital stock, and education stock are measured in current dollars and are positive in money terms, it would be incorrect to assume that they are positive in real terms.[12] For instance, an increase in output of $7 million

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[11] The best statistical results occur when a one-year time lag is used.

[12] There are statistical difficulties associated with converting these variables to constant dollars. Price indices for the province are not published; the only published regional indices are for a number of urban centres for consumer expenditures. In this case there is need for a provincial index for output and another one for investment expenditures. It is not the purpose of this study to construct price indices.

TABLE 6-2

DATA USED TO EXAMINE EFFECTS OF EDUCATION GRANTS ON NEW BRUNSWICK DEVELOPMENT, 1946-1967

| Year | Change in Output[a] (millions) | Labour Force[b] (thousands) | Change in Employed Labour Force (thousands) | Change in Capital Stock[c] (millions) | Federal Education Grants[d] (thousands) |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1946 | . . | 66.0 | . . | $ 49.7 | . . |
| 1947 | $ 25 | 70.2 | 4.2 | 60.3 | $ 623.1 |
| 1948 | 41 | 70.8 | 0.6 | 93.6 | 1,708.4 |
| 1949 | 18 | 67.3 | -2.5 | 104.1 | 1,161.4 |
| 1950 | 36 | 69.0 | 1.7 | 125.8 | 810.4 |
| 1951 | 48 | 73.4 | 4.4 | 125.8 | 910.6 |
| 1952 | 24 | 73.7 | 0.3 | 112.3 | 430.7 |
| 1953 | 13 | 68.2 | -5.5 | 110.3 | 662.0 |
| 1954 | 32 | 65.8 | -2.4 | 109.2 | 588.3 |
| 1955 | 29 | 69.3 | 3.5 | 147.3 | 588.0 |
| 1956 | 66 | 74.0 | 4.7 | 156.9 | 603.9 |
| 1957 | 14 | 70.5 | -3.5 | 125.4 | 601.4 |
| 1958 | 7 | 66.0 | -4.5 | 145.2 | 919.3 |
| 1959 | 54 | 68.4 | 2.4 | 166.1 | 1,378.2 |
| 1960 | 40 | 69.6 | 1.2 | 139.0 | 2,116.4 |
| 1961 | 12 | 69.9 | 0.3 | 128.7 | 1,916.2 |
| 1962 | 50 | 69.8 | -0.1 | 121.8 | 2,322.9 |
| 1963 | 49 | 70.3 | 0.5 | 133.6 | 2,828.0 |
| 1964 | 94 | 73.1 | 2.8 | 198.2 | 3,966.1 |
| 1965 | 118 | 76.7 | 3.6 | 271.5 | 4,038.6 |
| 1966 | 95 | 80.5 | 3.8 | 320.0 | 5,689.8 |
| 1967 | 79 | 81.5 | 1.0 | 305.0 | 4,053.1 |

[a]Table B-21, p. 247.

[b]Computed as per n. 3, p. 103.

[c]Table 6-1.

[d]Table A-25, p. 207, lagged one year.

may actually be a decrease in real output, depending on the price index.

## 4. Results

Because this production model is already in first differences and is linear, the estimate of the parameter of each variable is also the marginal physical productivity of that variable.[13] For instance, the estimate of the parameter for labour represents the marginal physical productivity of labour. Likewise the estimates of the parameters for capital and education grants represent the marginal physical productivities of capital and education respectively. It is, therefore, predicted that the parameters (and therefore the marginal physical productivities) would be positive but there is no a priori expectation as to the magnitude of the parameters.

The regression equation obtained is as follows:[14]

$$\Delta O = 4.13 + \underset{(0.09)}{0.15}\ \Delta C + \underset{(1.11)}{3.87}\ \Delta L + \underset{(0.004)}{0.01}\ E$$

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[13] For a description of a model using first differences, although for a different purpose, see Daniel B. Suits, "Forecasting and Analysis with an Econometric Model," American Economic Review, LII (March, 1962), 104-32.

[14] The coefficient of multiple determination, $R^2$, is 0.82 and the adjusted coefficient, $\bar{R}^2$, is 0.79. The F statistic is 25.95 which is significant at better than the 1 per cent level. The coefficients of partial determination are:

$$r^2_{21.34} = 0.65 \qquad r^2_{41.23} = 0.45$$

$$r^2_{31.24} = 0.40$$

where 1 refers to $\Delta O$, 2 refers to $\Delta L$, 3 refers to $\Delta C$, and 4 refers to E.

The standard errors are in parentheses. All parameters are significantly different from zero.[15]

There was an expectation that the three regression coefficients would be positive and this is borne out in the regression equation derived. What this means is that the marginal physical productivities of labour, capital, and federally-supported education stock are positive. Therefore, given constant levels of capital and labour, a small increase in federally-supported education stock will result in an increase in gross provincial product of .01 times the increase in education stock.

The input elasticity for the labour force mean is calculated by multiplying the marginal physical product of labour by the ratio of the mean of the stock of the labour force to the mean of the gross provincial product.[16] The resulting elasticity was +0.41 which could be interpreted as suggesting that a 1 per cent increase in the labour force would result in a 0.41 per cent increase in gross provincial product.

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[15]This is on the basis of a single-tail t-test. The single-tail test is appropriate since the signs of the coefficients had been predicted.

[16]Defined as: the percentage change in output/the percentage change in labour which is as follows:

$$\frac{\Delta O}{\Delta L} \times \frac{L}{O} = 3.87 \times \frac{70.8250}{674.0500}$$

$$= .4066$$

The corresponding input elasticities for capital and education can not be calculated from the available data.[17] Both calculations, if they could have been made, would have been of importance in gauging the importance of these inputs in the development of New Brunswick.

## 5. Conclusion

There has been an attempt in this chapter to test the hypothesis that education grants from the federal government assist the economic development of New Brunswick.

It has been shown that there is a positive marginal physical product for the educational stock resulting from federal grants to New Brunswick. Because an educational stock figure was unavailable, it was impossible to calculate the elasticity of output with respect to this particular input.

Some implications of the model are worth exploring. Let us suppose that the desired increment in output for 1961 had been $13 million instead of the actual $12 million. What increase in 1960 federal education grants would have brought about this desired increment in output *ceteris paribus*? It turns out that an increase in federal grants of $96.9 thousand (5.5 per cent) would have been sufficient. This represents an increase in grants of approximately

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[17] It was not possible to calculate the values of the capital stock or education stock; only first differences could be calculated. Supra, p. 105.

eighty cents per pupil. These results must be viewed with caution for, in fact, education grants and the increment in output may both be related in other than a causal way. However, subject to this precaution, it would appear that a small increase in education grants would lead to a significant increase in output.

All the coefficients were significant and with twenty-one readings, the sample is large enough that the results can be accepted with some degree of reliance.[18]

It is important to examine the data deficiencies. It must be remembered that output data, changes in capital stock, and educational expenditures by the federal government were not readily available in official statistics for New Brunswick. They were, however, estimated with some justification.[19] A more satisfactory (in the sense that more information would be derived) model could have been used had data been available for capital stock and educational

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[18]There are the usual problems of time series. On purely statistical grounds, one can never be sure whether Y responds to X or whether both variables are responding to some other influence.

[19]The purpose of Appendix A is to demonstrate how federal expenditures on education in New Brunswick can be compiled. Output data have been calculated by Das Gupta and further refined in Appendix B. Changes in capital stock had to be estimated from what is known about public and private investment and depreciation in New Brunswick and Canada. Supra, Table 6-1.

stock.[20] Even if the model in this chapter had been used, elasticities could have been calculated. It is clear, then, that the results presented in this chapter are subject to further testing if appropriate data can be obtained.

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[20] The reference here is to the residual model which would have found the amount of decrease in the residual as a result of federal education expenditures. It would also have been comparable to other studies done, whereas the model here has not been used in analyzing economic development in other jurisdictions.

# CHAPTER VII

# CONCLUSION

Government educational expenditures are under continuous scrutiny by policy makers. This study is an attempt to shed some light on the economic effect of federal education expenditures, particularly those directed towards the Province of New Brunswick. By implication the study must then involve an examination of federal-provincial financial relations.

In order to facilitate a review of the results of the study, this chapter is divided into four parts concerning federal systems, education expenditures, relevant data, and recent developments.

## 1. Federal Systems

A federal system exists when there are two governmental units (a central and a sub-central unit), each making decisions concerning the provision of certain public services in its respective autonomous jurisdiction. However, for the economist who is mainly concerned with the allocation of resources and the distribution of income, the structure of government is of interest only to the extent that it implies patterns of resource use and income distribution.

Federalism implies a mechanism by which geographical subsets of the population can influence the provision of public goods and services. The implications are discussed in Chapter I.

Canada has a federal system of government; the BNA Act allocates to the provincial governments certain exclusive powers with respect to the provision of public goods and collection of revenues. The BNA Act also allocates exclusive public goods provision and revenue collection powers to the federal government. Chapter II provides a review of the literature on the influences that federalism has on the degree of attainment of the economic objectives of equity, stabilization, efficiency, and growth.

In Chapter II, it is concluded that two of the objectives, efficiency and growth, are most relevant in a discussion of federal-provincial financial arrangements for education. In terms of efficiency, expenditures are suboptimal if spillovers exist. Federal grants can thus be justified in overcoming this allocative inefficiency. Federal grants are also justified if provincial growth can be shown to be stimulated by them. The expansion of government responsibilities has aggravated the problem of attaining a balanced federal system. As the number of responsibilities has increased and as the magnitude of expenditures on existing programs has increased, the need for adjustments in the allocation of fiscal resources between levels of government has become evident. The point to be emphasized is that the

federal system experienced in Canada influences the pattern of education expenditures. Federalism is not, however, the only significant influential factor.

## 2. Education Expenditures

In Chapter II efficiency and growth are established as justifications for federal grants. Chapters III to VI examine these justifications more closely.

Chapter III provides an introduction to the problem of education spillovers. A number of aspects of the question are examined. First, it is concluded that education is a public good which diminishes in importance geographically. Theories of resource allocation, specifically in multi-level governments, are reviewed, and it is thus established that goods which exhibit externalities should be provided by the more senior-level government or should be assisted by conditional grants from a more senior-level government.

It is in Chapter IV that the first empirical evaluation is made. In this analysis, the expenditure per pupil in each province is the dependent variable, while the independent variables include federal contributions as a percentage of total expenditures, the percentage of 5-24 year olds enrolled in public education, the percentage of total enrolment in post-elementary schools, and net migration by education level.

The most significant variable in the determination of per pupil education expenditures appears to be the

percentage enrolment in post-elementary schools. The other variable which seems to be consistently significant is the percentage of 5-24 year olds enrolled in public education. A positive attitude towards public education in the community would appear in increased enrolment in post-elementary schools and in the percentage enrolment of 5-24 year olds. Also, the percentage enrolment in post-elementary schools reflects provincial age differentials.

The migration variables appear to be insignificant in the determination of per pupil educational expenditures, while the coefficient for federal grants appears to be significant but of the wrong sign. In the case of the former, several possible explanations are offered in Chapter IV. These include the high degree of consistency between provinces in school-leaving age and curriculum, and the fact that the available sample of data is too small to make valic judgments. One possible reason offered in Chapter IV for the negative sign of the coefficient for federal grants is the standardization of grants programs.

Chapter V provides a review of the literature on the various methods of measuring the contribution of education to economic growth. After an examination of the simple correlation, the manpower needs, the returns-to-education, and the residual approaches, it appears that the residual approach is most useful as a means of measuring the importance of federal funding of education as an input into the production process in New Brunswick.

It is in Chapter VI that this approach is applied. Because of the data, all the variables (labour, capital and federally-supported education) are in first differences. The coefficient of each of the variables is positive and significantly different from zero. This indicates positive marginal physical productivities.

Feceral education grants are justified if they can be shown to improve the allocation of resources and/or to increase growth. In the case of resource allocation, it is concluded that federal government grants are not significant, but growth can be stimulated by education grants. Both results must be considered tentative on the basis of the available data. On balance, however, until there is further evidence to the contrary, it appears that federal education grants are justifiable. There are perhaps other reasons as well for their existence, such as fiscal needs, geographical equity, political considerations, and other factors.

### 3. Data

Consistent series of data for many of the variables are unavailable. Statistics Canada has moved to correct this through the publications of its education division. Statistics Canada collects its data directly from various federal and provincial departments, agencies, and crown corporations. For federal grants, federal organizations alone are surveyed; there is no attempt to reconcile the data with

receipts. Generally, the direct survey method permits variations in reporting by the respondents.

Other difficulties are evident in the data provided by Statistics Canada. As changes are made in the statistics, no attempt is made to reconcile previous data to newly collected data. Secondly, since the census occurs decennially, important data on education attainment, migration, and other variables are unavailable. Lastly, the definition of federal "education" grants to the provinces is narrow compared with the broader interpretation in this study.

Problems also exist with other sources of data. A major difficulty results from the accounting techniques used by various government departments. The Honourable E. J. Benson, when he was Minister of Finance, wrote that program planning and budgeting have been introduced by the federal government into Canada.[1] A proper conception of PPB is that it requires control and review by function within a program. Such can only be carried out when there are functional accounts. The accounting system used by some departments does not permit determination of the functional breakdown of programs.[2]

The two appendices constitute a major part of this study. Appendix A is an historical (1945-1967) review of

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[1]The Honourable E. J. Benson, "Budget Breakthrough: Adoption of PPB," Canadian Tax Journal, XVI (May-June, 1968), 161-67.

[2]This reference is particularly to ARDA. See Appendix A.

the federal grant programs for "education" and the payments made to New Brunswick under those programs--something which had not been done to date. The resulting compilation of data was used in the statistical tests carried out in Chapter VI.

Appendix B provides a review of the demographic and economic characteristics of New Brunswick. Of use in the statistical test in Chapter VI were the estimates of its gross provincial product.

The statistical testing in Chapter IV suffers from a lack of data of which migration data by education level were the most significant. These data were first gathered for the 1961 census but were not published. Further examination of spillovers depends on the availability of better migration data.

### 4. After 1967

In 1967 the basis for post-secondary education grants was changed. It was agreed that the federal government would increase its transfers to the provinces for post-secondary education from $5 per capita to 50 per cent of the operating costs of post-secondary education or $15 per capita, whichever is greater. At the same time, the method of payment was changed so that the provinces would receive an additional abatement of personal and corporate income taxes and an equalization payment; a final adjusting payment

or refund would be made to equalize the total transfer to what was due the province under the formula.

The agreement specified expenses which were not considered to be operating expenditures and defined deductions to be made from operating expenditures. It also defined "post-secondary education" to be any course certified by the Lieutenant-Governor in Council which is of twenty-four weeks' duration or more and requires junior matriculation for admission. Included in the agreement were a removal of the time limit for capital grants under the Technical and Vocational Training Assistance Act and an undertaking by the federal government of the full cost of adult training allowances and training programs. Other programs outlined in Appendix A, such as ARDA, veterans' allowances, and Canada Council payments, continue.

It would appear that these arrangements are not a departure in spirit from the idea of federal funding for education. Rather the method of payment has changed so that the administration is simpler. It is not our purpose here to discuss the advantages or disadvantages of this change. Although studies are presently being conducted to review the federal government's position with respect to the financing of post-secondary education, there is no indication of major shifts in the arrangements.[3]

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[3]See Richard Bastien, "Fiscal Federalism in Canada: Decentralization in the Modern State" (unpublished paper prepared for a meeting of the Society of Government Economists, December 28, 1972), p. 11.

TABLE 7-1

TOTAL FEDERAL PAYMENTS AND FEDERAL PAYMENTS TO NEW BRUNSWICK FOR EDUCATION, 1968-1973
(In Millions of Dollars)

| Year[a] | Personal Income Tax Abatement | Corporate Income Tax Abatement | Cash Transfers | Other Payments[b] | Total Value of Transfer to Provinces[c] |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| | | | Canada | | |
| 1968 | $174.1 | $52.5 | $182.7 | $ 13.0 | $ 422.3 |
| 1969 | 195.2 | 57.7 | 238.4 | 40.8 | 532.1 |
| 1970 | 239.6 | 64.7 | 303.6 | 40.8 | 648.9 |
| 1971 | 284.0 | 62.9 | 392.9 | 72.8 | 812.6 |
| 1972[d] | 321.1 | 63.4 | 449.8 | 135.3 | 969.6 |
| 1973[e] | 380.8 | 76.8 | 480.1 | 210.9 | 1,148.6 |
| | | | New Brunswick | | |
| 1968 | $2.6 | $0.8 | $2.6 | $ 3.3 | $ 9.3 |
| 1969 | 2.9 | 0.9 | 3.8 | 4.1 | 11.7 |
| 1970 | 3.7 | 1.0 | 5.1 | 4.5 | 14.3 |
| 1971 | 4.3 | 0.9 | 6.9 | 13.7 | 25.8 |
| 1972 | 4.9 | 1.0 | 8.2 | 15.0 | 29.1 |
| 1973 | 5.8 | 1.1 | 8.7 | 17.2 | 32.8 |

[a]Fiscal year ending March 31.

[b]Other payments include equalization payments plus for 1971 to 1973 other education subsidies set out in The National Finances which are unavailable for 1968 to 1970.

[c]It should be noted that New Brunswick is on the per capita arrangement.

[d]Estimated in July, 1971.

[e]Estimated in March, 1972.

Source: Canadian Tax Foundation, The National Finances (Toronto: Canadian Tax Foundation, various years, 1967-73), and for columns (4) to (6) Canada, Department of the Secretary of State, "Federal-Provincial Fiscal Arrangements Acts, 1967 and 1972" (unpublished tables, June 1, 1972).

Table 7-1 is a brief review of the education payments made to the Province of New Brunswick. In 1966-1967, New Brunswick had received $12.8 million[4] in education subsidies while in 1972-1973, the estimated subsidy for education in New Brunswick is valued at more than two and one-half times that amount, $32.8 million.

## 5. Concluding Remarks

This dissertation is an attempt to examine the implications of federal grants for education. In other words, the policy of the federal government directing grants to the provinces for education expenditures is questioned. To reject policy as being inappropriate, there must be some evidence that there are alternatives which are significantly better, or at the very least, there must be evidence that present policy is not accomplishing even partially the intentions set out for it. The evidence in this study would seem to suggest that federal education grants do not change the policy makers' response to spillovers but the economic development of New Brunswick appears to have been assisted by those grants. Although both conclusions are tentative, it would appear that a continuation of federal support for education would be justified. Further analysis based on better and more complete data would be desirable. Federal

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[4] Infra, p. 207, Table A-25.

grants for education do serve a purpose, and until evidence to the contrary becomes available, these grants should be continued.

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## APPENDIX A

## FEDERAL AID TO EDUCATION: HISTORICAL REVIEW

The purpose of this appendix is to show in both verbal and statistical form the historical evolution of various federal programs. The reader will note a brief description of each program accompanied by a table relating the amounts paid out under that program.[1]

### 1. Vocational Training Co-ordination Act[2]

#### i) Vocational School Assistance

The largest grants received under the Vocational Training Co-ordination Act were for vocational school assistance. These grants were made for two purposes--capital expenditures and ordinary annual expenditures. Under the latter, each province received an outright grant of $10,000 per annum as well as a grant to be matched by the province, allotted among the provinces on the basis of 15-19 year olds in the previous census of Canada. Originally, there was a ceiling of $1.9 million per annum and the program was to run only for ten years. As Newfoundland, the Northwest

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[1] All dollar values in the tables are in current dollars.

[2] Canada, The Vocational Training Co-ordination Act, 1942, 6 Geo. VI, ch. 34.

TABLE A-1

PAYMENTS MADE UNDER THE VOCATIONAL TRAINING CO-ORDINATION ACT, 1946-1961

| Year[a] | Receipts by N.B. Under the Vocational Training Co-ordination Act (in thousands of dollars) | On a Per Capita Basis | Payments by Canada Under the Vocational Training Co-ordination Act (in thousands of dollars) | On a Per Capita Basis |
|---|---|---|---|---|
| 1946 | $ 520.2 | $1.11 | $ 6,136.9 | $0.50 |
| 1947 | 953.9 | 1.99 | 15,471.6 | 1.25 |
| 1948 | 527.9 | 1.08 | 10,123.4 | 0.80 |
| 1949 | 341.1 | 0.68 | 6,066.3 | 0.47 |
| 1950 | 589.5 | 1.16 | 5,075.2 | 0.37 |
| 1951 | 230.4 | 0.45 | 4,370.3 | 0.31 |
| 1952 | 271.6 | 0.52 | 4,449.5 | 0.31 |
| 1953 | 240.8 | 0.45 | 4,960.8 | 0.34 |
| 1954 | 225.4 | 0.42 | 4,105.8 | 0.27 |
| 1955 | 247.1 | 0.45 | 4,031.7 | 0.26 |
| 1956 | 231.7 | 0.42 | 3,963.5 | 0.25 |
| 1957 | 247.1 | 0.44 | 4,059.7 | 0.25 |
| 1958 | 277.3 | 0.49 | 4,208.6 | 0.25 |
| 1959 | 359.3 | 0.62 | 7,653.7 | 0.44 |
| 1960 | 423.4 | 0.72 | 8,131.5 | 0.46 |
| 1961 | 992.3 | 1.68 | 8,452.7 | 0.47 |
| Total | $6,678.9 | | $101,261.2 | |
| Average | | $0.79 | | $0.44 |

[a]The data for receipts and payments are taken on a fiscal year basis ending March 31 while the population figures are for June 1 within the fiscal year. The figures for 1946 represent the fiscal year 1945-46 with the population June 1, 1945.

Source: Tables A-2 to A-9.

Territories, and the Yukon came into the agreement, the ceiling was raised so that by 1954-55 the allotment had been raised to $2.1 million per annum.

The federal contribution from the annual allotment was limited to an amount not in excess of the increase in provincial expenditures over a basic year prior to the agreement or 50 per cent of the actual provincial expenditures, whichever was the lesser. It was this stipulation which gave the provinces the impetus to increase vocational education--either in quantity or quality.

The provinces made a number of different decisions as to how the monies would be used. As well, some provinces claimed much more of their allotment than other provinces. Table A-2 shows the usage of the annual allotments during the first five years of the agreement.

In 1955, the Vocational Training Advisory Council recommended that the agreement giving annual allotments to the provinces be renewed for ten years with the federal contribution increased to an annual $5.0 million maximum. However, two one-year extensions were given while investigations were undertaken into needs.

On April 1, 1957 the Vocational and Technical Agreement No. 2 came into effect for a five-year period. This was to provide $15.0 million for sharing (50-50) in the operational and capital costs of approved programs and projects in technical institutes, trade institutes and

TABLE A-2

PERCENTAGE OF ANNUAL ALLOTMENTS CLAIMED TO MARCH 31, 1950
AND THE DISTRIBUTION OF CLAIMS BY FUNCTION, 1945-1950

| Province | % Annual Allotments Claimed | Percentage of Claims Spent on | | | | |
|---|---|---|---|---|---|---|
| | | Maintenance or Operations | Administration | Buildings | Equipment | Bursaries |
| Newfoundland[a] | 45.0 | 100.0 | . . | . . | . . | . . |
| P.E.I. | 93.0 | 24.0 | 1.7 | 74.0 | 0.3 | . . |
| Nova Scotia | 44.0 | 50.0 | 15.0 | 23.0 | 12.0 | . . |
| New Brunswick | 98.0 | 86.0 | 2.0 | 5.0 | . . | 7.0 |
| Quebec | 100.0 | 54.0 | 2.0 | 25.0 | 8.0 | 11.0 |
| Ontario | 100.0 | 100.0 | . . | . . | . . | . . |
| Manitoba | 25.0 | 72.0 | 4.0 | 18.0 | 2.5 | 3.5 |
| Saskatchewan | 58.0 | 53.0 | 7.7 | 35.0 | 4.3 | . . |
| Alberta | 92.5 | 95.0 | 1.0 | 0.5 | 3.5 | . . |
| B.C. | 94.0 | 85.0 | 12.0 | 3.0 | . . | . . |

[a]Newfoundland figures are for the year 1949-50 only.

Source: Canada, Department of Labour, Annual Report, 1951 (Ottawa: Queen's Printer, 1951), p. 73.

vocational high schools. For the first two years the annual appropriations were to be $2.5 million, $3.0 million for the third year, and $3.5 million for the last two years. Within the annual appropriation, $30.0 thousand was to be an unmatched grant to each province, $20.0 thousand was to be an unmatched grant to each territory, and the remainder was to be distributed according to the proportion of the population in the 15-19 year age group. The latter portion was to be matched.

Throughout this discussion the grants for capital purposes have been left out. They were rather significant. Originally, in 1946, a special Dominion allotment of $10.0 million was made available for capital expenditures on buildings and equipment subject to a deadline of March 31, 1948. These funds were to be distributed on the basis of the proportion of 15-19 year olds living in the province and were to be matched by the province. Immediately after the war there was a shortage of building equipment; consequently by order-in-council the time limit for expenditures under this program was extended to March 31, 1952 for all building and equipment submissions approved by the Minister by March 31, 1948, regardless of when the work was commenced or the order for equipment was placed.

There was a lumpiness in the payments with the major part of the funds being expended in 1949 and 1950. During

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later years, however, permission was granted for the annual allotments to be used for capital purposes.

The Vocational and Technical Training Agreement No. 2, which came into effect April 1, 1957, provided $25.0 million over five years for capital assistance. Again, this money was to be allotted on the basis of the population in the 15-19 age group, but this time provision was made to re-allot funds not required to match provincial government expenditures on approved projects. As there would not be sufficient funds to match all provincial capital expenditures in the field of vocational training, preference was to be given to the building and equipping of technical and trades institutes. Lower in priority were vocational training projects in secondary schools and special training centres.

By March 31, 1959, the provinces (other than Quebec) had capital projects planned or in progress which would require the full amount of federal assistance. Fifty-one per cent of these funds were allotted to institutes of technology, 26 per cent to combined institutes of technology and trade schools, 18 per cent to trade or occupational training schools, and 5 per cent to vocational high schools.

In December, 1960, by order-in-council, the federal government authorized a 75 per cent contribution to capital expenditures incurred by the provinces on training facilities. This gave early effect to the capital expenditure

TABLE A-3

VOCATIONAL SCHOOL ASSISTANCE, 1946-1961
(In Thousands of Dollars)

| Year[a] | Payments to New Brunswick | | | Payments by Canada | | |
|---|---|---|---|---|---|---|
| | Annual | Building | Equipment | Annual | Building | Equipment |
| 1946 | $ 81.6 | . . | . . | $ 607.5 | . . | . . |
| 1947 | 71.0 | . . | . . | 1,488.3 | $ 446.4 | $ 72.0 |
| 1948 | 22.8 | . . | . . | 1,999.9 | 991.8 | 233.2 |
| 1949 | 174.8 | . . | . . | 1,974.4 | 1,856.7 | 422.8 |
| 1950 | 102.7 | $ 324.8 | $ 30.1 | 1,838.7 | 1,697.3 | 357.4 |
| 1951 | 92.7 | . . | 17.9 | 2,082.9 | 796.8 | 358.1 |
| 1952 | 92.7 | . . | 60.2 | 2,308.3 | 594.6 | 262.9 |
| 1953 | 89.8 | . . | . . | 2,120.2 | 913.0 | 221.0 |
| 1954 | 89.8 | . . | . . | 2,065.6 | 100.0 | 185.8 |
| 1955 | 89.8 | . . | . . | 2,029.5 | 219.2 | 73.1 |
| 1956 | 89.8 | . . | . . | 2,151.7 | . . | 2.6 |
| 1957 | 89.8 | . . | . . | 2,069.3 | . . | . . |
| 1958 | 117.4 | 18.6 | b | 979.8 | 865.4 | b |
| 1959 | 117.4 | 20.2 | b | 2,435.1 | 2,360.6 | b |
| 1960 | 137.7 | 72.9 | b | 2,049.5 | 3,090.0 | b |
| 1961 | 158.0 | 567.4 | b | 2,347.7 | 2,818.7 | b |
| Total[c] | $1,617.9 | $1,003.7[d] | $108.3 | $30,548.5 | $16,750.4[d] | $2,188.9 |

[a]Fiscal year ending March 31.

[b]Included in the figures for building.

[c]Because of rounding the figures do not necessarily add up.

[d]Part of which is for equipment.

Source: Canada, Department of Labour, Annual Report (Ottawa: Queen's Printer, various years, 1946-61), and Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1946-61).

provisions of the Technical and Vocational Training Assistance Act, 1961.[3] By the end of the fiscal year, the Minister of Labour had approved projects for capital expenditures totalling $4.3 million.[4]

ii) War Emergency Training

During the Second World War and immediately following the greatest single task undertaken under the Vocational Training Co-ordination Act was the training of workers involved with varying aspects of defence. Various programs came under the general agreement on war emergency training. These included: (a) training for the armed forces, (b) training of workers in defence industries, (c) supervisory training, (d) training of veterans for civilian jobs, and (e) supplying buildings and equipment for such programs. Each will be examined in turn.

In 1945-46 the importance of training armed forces personnel was decreasing. No payments were made under this schedule between March 31, 1946 and the start of the Korean War at which time this schedule again provided a small amount of training. In some cases, this was pre-enlistment training while in other cases training was provided for enlisted men.

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[3]Canada, Technical and Vocational Training Assistance Act, 1961, 9 Eliz. II, ch. 6.

[4]Canada, Department of Labour, Annual Report, 1946 (Ottawa: Queen's Printer, 1946), p. 68.

Under this schedule, the federal government bore 100 per cent of the cost of training while the provincial governments paid certain administrative charges and provided vocational shops in the existing technical and vocational schools without charge for rental or depreciation.

The above schedule was split in 1952 into "Training for the Armed Forces" (K-1) and "Training of Workers in Defence Industries" (K-2). Under the provisions of the latter, the provinces were reimbursed for 75 per cent of the cost of operating classes. New Brunswick did not participate in either program after March 31, 1956.

In 1945-46, supervisory training was carried on as part of Schedule K, but during that year the provincial governments were notified that after March 31, 1946, the Department of Labour would share approved costs on a 50-50 basis only when the province indicated willingness. The Province of New Brunswick never undertook this type of training.

The program of training veterans was a massive one for a few years. The largest single grants under any part of the Vocational Training Co-ordination Act were distributed for this purpose in 1946-47. The purpose was to provide training and facilities

> in accordance with the two following factors: (a) the number of veterans desiring training and approved for such training in different occupations by the Department

of Veterans Affairs; (b) the anticipated field of employment in each occupation.[5]

The federal Department of Labour co-operated with all provincial governments but with the costs of training veterans borne solely by the Dominion. The only exception was for certain items of capital equipment towards which the provinces contributed 50 per cent of the purchase price in return for outright ownership when the equipment was no longer required for the training of veterans.

On December 31, 1947, responsibility for the supervision of veteran training in private schools was transferred to the Department of Veterans Affairs. By 1950, the program was phased out in its entirety although payments were continued until 1952. Some of the feeling within the Department of Labour was evidenced in the following quotation:

> While Canadian veterans have been rehabilitated through vocational training in special C.V.T. schools and on the job veterans in other countries have been waiting in tens of thousands to get into schools, or going slowly through the technical schools with adolescents.[6]

Finally, under War Emergency Training, capital payments were made to the provinces from a special fund. This fund, which was administered by the Department of Labour, had been authorized in May, 1945. The fund had three major

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[5]Canada, The Vocational Training Co-ordination Act, 1942, 6 Geo. VI, ch. 34.

[6]Canada, Department of Labour, Annual Report, 1948, p. 39.

TABLE A-4

DEFENCE-RELATED TRAINING, 1946-1961
(In Thousands of Dollars)

| Year[a] | Payments Made to New Brunswick | | | | | |
|---|---|---|---|---|---|---|
| | K-1[b] | K-2[c] | L[d] | Buildings | Equipment | Total[e] |
| 1946 | $ 33.6 | . . | $ 258.6 | $ 4.5 | $ 98.6 | $ 395.3 |
| 1947 | . . | . . | 667.4 | 5.8 | 168.5 | 841.6 |
| 1948 | . . | . . | 415.4 | . . | 51.9 | 467.3 |
| 1949 | . . | . . | 104.9 | . . | 5.1 | 109.9 |
| 1950 | 15.9 | . . | 10.4 | . . | . . | 26.3 |
| 1951 | 14.3 | . . | 1.8 | . . | . . | 16.0 |
| 1952 | 12.1 | $13.0 | . . | . . | . . | 25.2 |
| 1953 | 12.6 | 19.5 | . . | . . | . . | 32.1 |
| 1954 | 5.9 | 9.1 | . . | . . | . . | 15.0 |
| 1955 | 5.0 | 2.5 | . . | . . | . . | 7.5 |
| 1956 | 4.7 | . . | . . | . . | . . | 4.7 |
| 1957 | . . | . . | . . | . . | . . | . . |
| 1958 | . . | . . | . . | . . | . . | . . |
| 1959 | . . | . . | . . | . . | . . | . . |
| 1960 | . . | . . | . . | . . | . . | . . |
| 1961 | . . | . . | . . | . . | . . | . . |
| Total[e] | $104.2 | $44.1 | $1,458.4 | $10.3 | $324.0 | $1,941.0 |

[a]Fiscal year ending March 31.

[b]Training for the armed forces.

[c]Training for defence industries.

[d]Training for war veterans.

[e]Because of rounding the totals do not necessarily add.

Source: Canada, Department of Labour, Annual Report (Ottawa: Queen's Printer, various years, 1946-61), and Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1946-61).

TABLE A-5

DEFENCE-RELATED TRAINING, 1946-1961
(In Thousands of Dollars)

| Year[a] | Payments Made by Canada | | | | | | |
|---|---|---|---|---|---|---|---|
| | K-1[b] | K-2[c] | L[d] | Building | Equipment | Supervisory | Total[e] |
| 1946 | $ 700.6 | . . | $ 3,805.1 | $179.3 | $ 369.9 | . . | $ 5,054.8 |
| 1947 | . . | . . | 10,485.5 | 259.7 | 2,052.5 | $ 12.1 | 12,809.8 |
| 1948 | . . | . . | 5,279.3 | 37.2 | 1,027.7 | 11.2 | 6,355.4 |
| 1949 | . . | . . | 968.5 | 1.5 | 98.6 | 9.6 | 1,078.3 |
| 1950 | 69.2 | . . | 107.6 | . . | . . | 5.7 | 182.5 |
| 1951 | 56.1 | . . | 14.1 | . . | . . | 7.8 | 77.9 |
| 1952 | 93.5 | $ 60.6 | . . | . . | . . | 7.6 | 161.7 |
| 1953 | 84.2 | 102.1 | . . | . . | . . | 7.9 | 194.1 |
| 1954 | 80.8 | 112.9 | . . | . . | . . | 9.0 | 202.7 |
| 1955 | 92.8 | 66.7 | . . | . . | . . | 4.1 | 163.7 |
| 1956 | 77.8 | . . | . . | . . | . . | 3.6 | 81.4 |
| 1957 | 40.0 | . . | . . | . . | . . | 3.9 | 43.9 |
| 1958 | 37.8 | . . | . . | . . | . . | 9.3 | 47.1 |
| 1959 | 33.3 | . . | . . | . . | . . | 7.8 | 41.1 |
| 1960 | 30.0 | . . | . . | . . | . . | 8.5 | 38.5 |
| 1961 | 18.5 | . . | . . | . . | . . | 13.8 | 32.3 |
| Total[e] | $1,414.5 | $342.3 | $20,660.0 | $477.7 | $3,548.7 | $122.1 | $26,565.3 |
| % Going to N.B. | 7.4 | 12.9 | 7.1 | 2.2 | 9.1 | 0 | 7.3 |

[a]Fiscal year ending March 31.

[b]Training for the armed forces.

[c]Training for defence industries.

[d]Training for war veterans.

[e]Because of rounding the totals do not necessarily add.

Source: Canada, Department of Labour, Annual Report (Ottawa: Queen's Printer, various years, 1946-61), and Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1946-61).

purposes:

a) the acquisition of buildings and property from the War Assets Corporation, Departments of the federal government and other bodys [sic];
b) for alterations to premises acquired for training; and
c) for the purchase of equipment from the War Assets Corporation and other bodys [sic].[7]

This fund was of importance only until 1948-49 after which no payments were made.

iii) Retraining of Civilian Workers

At the end of the war, civilian retraining was a new concept. During 1945-46 only four provinces reached agreement with the federal government to provide this type of training and they claimed only one thousand dollars of a $1.5 million allotment. The reason for this was that first priority was given to the training of former members of the forces.

Under the agreements, the federal government was to pay the training allowances at a weekly scale to the trainees, the federal government and the provinces sharing equally the capital expenditures for equipment. For all other expenditures the federal government was to pay 60 per cent, while the provincial governments paid 40 per cent.

However, in 1947-48, the Act was amended by Parliament to provide for unemployed civilians who were not in

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[7]Canada, Department of Labour, Annual Report, 1946, p. 72.

receipt of Unemployment Insurance. At the same time, greater authority was given to the provinces in the selection of trainees and courses. In return, the approved costs were to be shared equally between the province and the federal government with the province being responsible for recommending the scale of training allowances which should be paid.

By 1950-51, New Brunswick was offering training to men in barbering, blacksmithing, cabinet-making, machine-shop, shoe-repair, upholstering, and welding and to women in dress-making, nursing-aides, and handicrafts.

In 1954-55, the schedule was divided into "Training for Unemployed Persons" (Schedule M) and "Training for Disabled Persons" (Schedule R). The latter was a recognition of the individual requirements of each trainee. Only people who were handicapped because of a continuing disability and who could be fitted for suitable self-supporting employment qualified for funds.

During the years of heavy unemployment, 1960-61, the provinces were encouraged by the federal government to expand their programs for training of unemployed workers. Instead of offering 50 per cent of the provincial costs of such programs, the federal government now offered to reimburse the provinces for 75 per cent of costs.

TABLE A-6

RETRAINING OF CIVILIAN WORKERS, 1946-1961
(In Thousands of Dollars)

| Year[a] | Received by New Brunswick | | | Paid Out by Canada | | | % to N.B. |
|---|---|---|---|---|---|---|---|
| | Unemployed | Disabled | Total[c] | Unemployed | Disabled | Total[c] | |
| 1946 | . . | . . | . . | $ 1.4 | b | $ 1.4 | . . |
| 1947 | . . | . . | . . | 6.3 | b | 6.3 | . . |
| 1948 | $ 6.6 | b | $ 6.6 | 39.5 | b | 39.5 | 16.7 |
| 1949 | 26.0 | b | 26.0 | 143.5 | b | 143.5 | 18.1 |
| 1950 | 34.6 | b | 34.6 | 232.3 | b | 232.3 | 14.9 |
| 1951 | 31.3 | b | 31.3 | 256.3 | b | 256.3 | 12.2 |
| 1952 | 36.7 | b | 36.7 | 236.9 | b | 236.9 | 15.5 |
| 1953 | 34.9 | b | 34.9 | 227.8 | b | 227.8 | 15.3 |
| 1954 | 37.3 | b | 37.3 | 275.5 | b | 275.5 | 13.5 |
| 1955 | 47.5 | $ 16.4 | 63.9 | 333.8 | $ 22.0 | 355.8 | 18.0 |
| 1956 | 19.2 | 23.9 | 43.1 | 401.8 | 74.2 | 476.1 | 9.1 |
| 1957 | 16.4 | 33.0 | 49.4 | 374.2 | 174.3 | 548.5 | 9.0 |
| 1958 | 16.4 | 50.8 | 67.3 | 397.5 | 270.4 | 667.8 | 10.1 |
| 1959 | 39.4 | 44.9 | 84.3 | 510.5 | 265.9 | 776.4 | 10.9 |
| 1960 | 30.8 | 43.4 | 74.3 | 545.5 | 283.3 | 828.7 | 9.0 |
| 1961 | 75.0 | 49.6 | 124.6 | 995.9 | 329.6 | 1,325.5 | 9.4 |
| Total[c] | $452.4 | $262.0 | $714.4 | $4,978.6 | $1,419.7 | $6,398.3 | 11.2 |

[a]Fiscal year ending March 31.

[b]Included in unemployed figures.

[c]Because of rounding the totals do not necessarily add.

Source: Canada, Department of Labour, Annual Report (Ottawa: Queen's Printer, various years, 1946-61).

iv) Apprenticeship Training

From a small beginning in 1945-46, the funds expended by the Canadian government on apprentice training agreements had grown more than thirty-eight times by 1960-61. During the period under review, all provinces except Prince Edward Island and Quebec had apprenticeship agreements with the federal government.

In each agreement, provision was made for class training (partly practical and partly technical) in related subjects as well as correspondence courses. For the training of civilians, the Department of Labour shared equally with the province in the following expenditures connected with class training:

a) salaries of instructors;

b) cost of materials, supplies, equipment, and hand tools;

c) weekly allowances and travelling expenses of those apprentices taking full-time class instruction;

d) cost of correspondence courses;

e) limited provision of premises for class training; and

f) some expenditures connected with meetings of the Trade Advisory Committees.

These shared responsibilities were extended in 1948 when it was agreed to share equally in the salaries and travelling expenses of a specified number of field supervisors for apprentices as well as certain operating costs for centres

run by the provinces for apprenticeship classes. When the first agreements expired in 1953-54, a new set of agreements covering all the areas previously included as well as designated administrative expenditures were established. As well, 1953-54 saw the first payments to Newfoundland.

Under these agreements, payments were made only for indentured apprentices registered under the provisions of the provincial apprenticeship acts. Payments were not made for those apprentices who were being trained in industry by corporations and individual employers.

In the immediate post-war years, the federal Department of Labour bore the entire cost of apprenticeship training for those veterans who were eligible under the federal rehabilitation legislation and approved by the Department of Veterans Affairs. An exception was the payment of training allowances which were paid directly by the Department of Veterans Affairs.

Table A-7 shows the federal contributions to apprenticeship training. It should be noted that the grant per apprentice in New Brunswick rose sevenfold from 1947 to 1961, while the number of apprentices rose sixfold. Thus, the total sum received by New Brunswick increased by more than fifty times (5,389 per cent).

TABLE A-7

APPRENTICE TRAINING, 1946-1961

| Year[a] | New Brunswick | | | Canada | | |
|---|---|---|---|---|---|---|
| | Amount Received (000's) | Apprentices (000's) | Amount Per Apprentice | Amount Paid Out (000's) | Apprentices (000's) | Amount Per Apprentice |
| 1946 | . . | [b] | . . | $ 43.1 | $ 4.9 | $ 8.77 |
| 1947 | $ 1.8 | $ .2 | $12.12 | 101.4 | 10.2 | 9.92 |
| 1948 | 5.9 | .3 | 22.02 | 118.0 | 11.9 | 9.91 |
| 1949 | 11.8 | .4 | 30.93 | 255.3 | 11.0 | 23.25 |
| 1950 | 36.8 | [c] | [c] | 399.6 | [c] | [c] |
| 1951 | 34.9 | .5 | 73.08 | 427.6 | 10.9 | 39.41 |
| 1952 | 23.5 | .7 | 36.01 | 494.4 | 11.0 | 44.81 |
| 1953 | 44.1 | .7 | 64.09 | 774.7 | 11.7 | 65.95 |
| 1954 | 39.6 | .7 | 59.71 | 753.2 | 12.9 | 58.38 |
| 1955 | 44.4 | .8 | 57.40 | 839.0 | 14.0 | 59.83 |
| 1956 | 51.6 | .9 | 57.47 | 891.3 | 15.3 | 58.14 |
| 1957 | 69.5 | 1.0 | 71.61 | 1,034.0 | 16.7 | 62.05 |
| 1958 | 60.8 | .9 | 70.41 | 1,331.7 | 17.5 | 75.95 |
| 1959 | 71.9 | 1.0 | 74.50 | 1,674.6 | 18.6 | 90.19 |
| 1960 | 94.3 | 1.1 | 89.00 | 1,790.5 | 20.0 | 89.69 |
| 1961 | 98.8 | 1.2 | 84.54 | 1,638.0 | 20.3 | 80.58 |
| Totals[d] | $689.7 | | | $12,566.4 | | |
| Average | | | $53.59 | | | $51.78 |

[a]Fiscal year ending March 31.

[b]Less than a significant number.

[c]The Department of Labour did not publish statistics for this year.

[d]Because of rounding totals do not necessarily add.

Source: Canada, Department of Labour, Annual Report (Ottawa: Queen's Printer, various years, 1946-61), and Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1946-61).

v) Youth Training

The purpose of this part of the Vocational Training Co-ordination Act was to carry on programs established under the Youth Training Act, 1939.[8] Youth training had been provided originally to meet the needs of young people who, because of the depression in the 1930's, had never been permanently employed and who required a period of training to acquire gainful employment. The major part of the program consisted of a wide range of short-term classes (from a few days to several months) for young people sixteen to thirty years of age (the upper limit was removed in 1953-54). These classes were in various phases of agriculture, homemaking, leadership, and such occupational courses as farm mechanics, commercial work, nurses' aides, dressmaking, power sewing, diesel and auto mechanics, and courses for fishermen in navigation, marine engines, nets and cording, and general fishing operations. During the latter years, the fishing and agricultural programs took most of the funds.

Fifty per cent of funds expended on approved projects were provided by the federal government. As can be seen in Table A-8, New Brunswick received approximately the same amount in 1961 as it had in 1946. At the same time, the funds provided by the federal government decreased by slightly more than 30 per cent from $430 thousand to $288 thousand.

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[8]Canada, Youth Training Act, 1939, 3 Geo. VI, ch. 35.

TABLE A-8

YOUTH TRAINING AND STUDENT AID, 1946-1961
(In Thousands of Dollars)

| Year[a] | Received by New Brunswick | | | Paid Out by Canada | | |
|---|---|---|---|---|---|---|
| | Youth Training | Student Aid | Total[e] | Youth Training | Student Aid | Total[e] |
| 1946 | $ 28.1 | $ 15.1 | $ 43.3 | $ 257.7 | $ 172.5 | $ 430.2 |
| 1947 | 27.8 | 11.6 | 39.4 | 344.9 | 202.4 | 547.3 |
| 1948 | 25.2 | b | 25.2 | 385.6 | b | 385.6 |
| 1949 | 18.7 | b | 18.7 | 335.3 | b | 335.3 |
| 1950 | 34.1 | b | 34.1 | 367.4 | b | 367.4 |
| 1951 | 37.6 | b | 37.6 | 368.1 | b | 368.1 |
| 1952 | 33.3 | b | 33.3 | 386.2 | b | 386.2 |
| 1953 | 39.9 | b | 39.9 | 505.4 | b | 505.4 |
| 1954 | 43.2 | b | 43.2 | 515.5 | b | 515.5 |
| 1955 | 41.4 | b | 41.4 | 350.3 | b | 350.3 |
| 1956 | 27.7 | 14.8 | 42.5 | 132.8 | 206.8 | 339.6 |
| 1957 | 24.2 | 14.3 | 34.5 | 142.4 | 210.0 | 352.4 |
| 1958 | 13.2 | . . | 13.2 | 111.4 | 201.0 | 312.4 |
| 1959 | 35.5 | 30.0 | 65.5 | 132.7 | 230.9 | 363.6 |
| 1960 | 28.9[c] | 15.0[d] | 43.9 | 117.6 | 215.8 | 333.4 |
| 1961 | 28.4[c] | 15.0[d] | 43.4 | 100.9 | 187.2 | 288.0 |
| Total[e] | $487.2 | $115.8 | $603.0 | $4,554.1 | $1,626.6 | $6,180.8 |

[a]Fiscal year ending March 31.

[b]Included with Youth Training.

[c]These payments were made under a new schedule "P" (Training in Primary Industries and in Homemaking) which includes most programs previously carried out under Youth Training.

[d]These payments were made under a new schedule "H" (Student Aid) which had previously been at times a sub-schedule of Youth Training.

[e]Because of rounding totals do not necessarily add.

Source: Canada, Department of Labour, Annual Report (Ottawa: Queen's Printer, various years, 1946-61), and Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1946-61).

The chief sub-schedule of youth training dealt with student aid. In each province, the funds expended under this schedule aided prospective teachers, nurses in training, and university students of good academic standing who, without financial assistance, could not start or continue their course. The assistance could be in the form of a loan, a grant, or a combination of the two. The province had discretion in this matter and in New Brunswick only loans were used during the years examined.

It will be noted in Table A-8, that the funds for student aid decreased slightly during the period under review. The decrease in funds under this program were more than compensated for by other programs intended to accomplish the same purposes.

vi) Other Support Under the Act

There were two other programs under which small sums of money were paid to the provinces. These were Vocational Correspondence Courses and Training for Government Departments. Under the latter New Brunswick did not receive any funds. It was an agreement between the federal Department of Labour and the provincial authorities to train prospective goverrment employees or to upgrade those employees already working for the government--the total costs being paid by the federal government but with training provided by provincial schools. Training included such fields as

airport maintenance, machine operation, stationary engineering, naval architectural drafting, teletype operation, and varitype operation. The funds expended by the federal government on this type of training can be found in Table A-9.

It is evident in Table A-9 that New Brunswick received two payments totalling less than a thousand dollars for Vocational Correspondence Courses. These payments were made under an agreement with the federal government with a federal share of 50 per cent of the cost of preparing a vocational correspondence course (new or revised) on the condition that the province would make available any such course to non-residents of the province at the same charge as residents.

### 2. Technical and Vocational Training Assistance Act

In 1960, the Diefenbaker government was faced with much unemployment which was seemingly caused by automated industries requiring fewer untrained employees. The reaction was to expand the federal funds available to the provinces for vocational training. In order to do so, the new Technical and Vocational Training Assistance Act was given Royal assent on December 20, 1960. In the first full year under the new Act, New Brunswick received $1.5 million as opposed to $0.9 million in the last year of the previous Act--an increase of 57.5 per cent in the one year.

TABLE A-9

OTHER PROGRAMS, 1946-1961
(In Thousands of Dollars)

| Year[a] | Training for Government Departments (Canada) | Correspondence Courses in New Brunswick | Correspondence Courses in Canada |
|---|---|---|---|
| 1946 | . . | . . | . . |
| 1947 | . . | . . | . . |
| 1948 | . . | . . | . . |
| 1949 | . . | . . | . . |
| 1950 | . . | . . | . . |
| 1951 | . . | . . | $ 2.6 |
| 1952 | . . | . . | 4.6 |
| 1953 | . . | . . | 4.6 |
| 1954 | . . | $.5 | 7.5 |
| 1955 | $ 1.1 | . . | . . |
| 1956 | 6.5 | . . | 14.4 |
| 1957 | 7.8 | . . | 3.9 |
| 1958 | 2.1 | . . | 2.1 |
| 1959 | . . | . . | 2.3 |
| 1960 | . . | .4 | .8 |
| 1961 | .7 | . . | 1.8 |
| Total[b] | $18.2 | $.9 | $44.6 |

[a]Fiscal year ending March 31.

[b]Because of rounding totals do not necessarily add.

Source: Canada, Department of Labour, Annual Report (Ottawa: Queen's Printer, various years, 1946-61), and Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1946-61).

There were two agreements under the Act. These were the Technical and Vocational Training Agreement and the Apprenticeship Training Agreement. Under the former, there were provisions for ten programs as well as a Capital Expenditures Program and a Technical and Vocational Correspondence Courses Program. The Apprenticeship Training Agreement was a continuation of other agreements for apprenticeship training only.

The amounts received by New Brunswick and paid out by Canada for the fiscal years ending March 31, 1962 to March 31, 1967 can be found in Tables A-10 and A-11 respectively. New Brunswick received $16.1 million in the six years under this Act which was an average of $4.38 per capita per year. In the same period, the federal government paid out $851.5 million or $1.23 per capita per year.

i) Vocational High School Training--Program 1

Program 1 was meant to provide support for secondary courses in which at least half of the time was devoted to "technical, commercial, or other vocational subjects." The courses had to be designed to prepare the graduating student for entry into employment or graduate vocational training.

Thirty thousand dollars was allotted to each province and $20 thousand was allotted to the Yukon and to the Northwest Territories. The balance of $3.0 million was to be divided between the provinces and the territories on the

TABLE A-10

PAYMENTS RECEIVED BY NEW BRUNSWICK UNDER THE TECHNICAL AND VOCATIONAL TRAINING ASSISTANCE ACT, 1962-1967
(In Thousands of Dollars)

| Year[a] | Program 1[b] | Program 2 | Program 3 | Program 4 | Program 5 | Program 6 | Program 7 | Program 8 | Program 9 | Program 10 | Apprenticeship Training | Correspondence Courses | Capital Expenditures | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | $137.7 | $ 6.3 | $ 190.0 | $ 7.0 | $ 270.8 | $ 33.9 | $ 8.7 | . . | . . | . . | $ 88.5 | $0.7 | $ 819.0 | $ 1,562.6 |
| 1963 | 93.9 | 32.6 | 251.7 | 12.1 | 206.5 | 52.1 | 14.0 | . . | $14.9 | . . | 89.7 | 2.0 | 1,853.1 | 2,622.8 |
| 1964 | 36.1 | 32.9 | 167.8 | 2.3 | 307.3 | 25.1 | 50.4 | . . | 11.0 | . . | 63.8 | . . | 1,563.0 | 2,259.7 |
| 1965 | 260.0 | 130.2 | 1,370.0 | 6.1 | 207.7 | 39.6 | 56.9 | . . | 10.0 | . . | 45.6 | . . | 1,858.2 | 3,984.3 |
| 1966 | 130.0 | 127.8 | 859.7 | .3 | 151.9 | 24.0 | 64.6 | . . | 9.8 | . . | 166.5 | . . | 303.5 | 1,848.0 |
| 1967 | 110.2 | 154.9 | 1,886.6 | 5.2 | 692.6 | 15.5 | 57.1 | . . | 15.0 | . . | 158.0 | . . | 768.3 | 3,863.4 |
| Total | $767.9 | $484.7 | $4,735.8 | $32.9 | $1,834.8 | $190.2 | $251.8 | . . | 560.7 | . . | $612.1 | $2.7 | $7,167.1 | $16,140.7 |

[a] Fiscal year ending March 31.

[b] The programs are:
1. Vocational High School Training;
2. Technician Training;
3. Trade and Other Occupational Training;
4. Training in Co-operation with Industry;
5. Training of the Unemployed;
6. Training of the Disabled;
7. Vocational and Technical Teacher Training;
8. Training for Federal Departments and Agencies;
9. Student Aid; and
10. Training Research.

Source: Canada, Department of Manpower and Immigration, Program Support Branch, "Federal Expenditures for Vocational Training, Cumulative Actual" (unpublished T.I.S., No. 222-8). (Mimeographed.)

TABLE A-11

PAYMENTS MADE BY THE FEDERAL GOVERNMENT UNDER THE TECHNICAL AND VOCATIONAL TRAINING ASSISTANCE ACT, 1962-1967
(In Thousands of Dollars)

| Year[a] | Program 1[b] | Program 2 | Program 3 | Program 4 | Program 5 | Program 6 | Program 7 | Program 8 | Program 9 | Program 10 | Apprenticeship Training | Correspondence Courses | Capital Expenditures | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | $ 1,964.7 | $ 3,331.9 | $ 5,429.0 | $ 31.2 | $ 3,941.6 | $ 368.2 | $ 212.6 | $ 26.5 | $ 322.3 | . . | $2,160.9 | $ 8.5 | $ 17,901.9 | $ 35,729.6 |
| 1962[c] | 7.0 | 0.2 | 3.5 | 22.4 | 6.9 | 9.2 | 4.1 | . . | . . | . . | 4.1 | 8.2 | 4.6 | 4.4 |
| 1963 | 1,930.0 | 6,794.2 | 8,172.7 | 56.9 | 7,751.1 | 748.6 | 232.9 | 69.2 | 319.1 | . . | 2,172.1 | 41.9 | 179,627.0 | 207,915.4 |
| 1963[c] | 4.9 | 0.5 | 3.1 | 21.4 | 2.7 | 7.0 | 6.0 | . . | 4.7 | . . | 4.1 | 4.8 | 1.0 | 1.3 |
| 1964 | 2,765.4 | 7,064.1 | 10,288.2 | 88.0 | 10,492.3 | 605.0 | 380.5 | 58.8 | 315.7 | . . | 2,334.9 | 1.3 | 102,037.7 | 136,432.0 |
| 1964[c] | 1.3 | 0.5 | 1.6 | 2.6 | 2.9 | 4.1 | 13.2 | . . | 3.5 | . . | 2.7 | . . | 1.5 | 1.6 |
| 1965 | 3,575.0 | 10,238.6 | 14,398.9 | 329.1 | 13,600.0 | 646.0 | 614.6 | 61.9 | 290.7 | . . | 694.9 | 28.9 | 52,758.3 | 97,224.9 |
| 1965[c] | 7.3 | 1.3 | 9.5 | 1.9 | 1.5 | 6.1 | 9.3 | . . | 3.4 | . . | 6.6 | . . | 3.5 | 4.1 |
| 1966 | 2,278.3 | 3,934.1 | 15,383.6 | 629.4 | 23,979.4 | 799.9 | 429.2 | 73.5 | 194.9 | $ 12.1 | 920.1 | 36.5 | 104,089.5 | 152,760.5 |
| 1966[c] | 5.7 | 3.2 | 5.7 | . . | 0.6 | 3.0 | 15.1 | . . | 5.0 | . . | 18.1 | . . | 0.9 | 1.2 |
| 1967 | 1,626.1 | 6,035.4 | 18,731.3 | 1,194.0 | 54,222.2 | 818.7 | 1,081.9 | 114.5 | 204.2 | 115.1 | 1,174.1 | 3.7 | 136,056.4 | 221,387.7 |
| 1967[c] | 6.8 | 2.6 | 10.1 | 0.4 | 1.3 | 1.9 | 5.3 | . . | 7.3 | . . | 12.6 | . . | 0.6 | 1.7 |
| Total | $14,139.5 | $37,418.3 | $72,404.2 | $2,328.2 | $113,996.7 | $3,996.4 | $2,951.9 | $404.8 | $1,656.9 | $127.2 | $9,457.0 | $108.8 | $592,470.3 | $851,450.2 |
| | 5.4 | 1.3 | 6.5 | 1.4 | 1.6 | 4.8 | 8.2 | . . | 3.7 | . . | 6.5 | 2.5 | 1.2 | 1.9 |

[a]Fiscal year ending March 31.

[b]The programs are:
1. Vocational High School Training;
2. Technician Training;
3. Trade and Other Occupational Training;
4. Training in Co-operation with Industry;
5. Training of the Unemployed;
6. Training of the Disabled;
7. Vocational and Technical Teacher Training;
8. Training for Federal Departments and Agencies;
9. Student Aid; and
10. Training Research.

[c]New Brunswick receipts expressed as a percentage of the total federal payments.

Source: Canada, Department of Manpower and Immigration, Program Support Branch, "Federal Expenditures for Vocational Training, Cumulative Actual" (unpublished T.I.S., No. 222-8). (Mimeographed.)

basis of the ratio of the number of 15-19 year olds residing in each area to the total number of persons in that age group in Canada. These funds were not to provide in excess of 50 per cent of provincial costs.

Between 1961 and 1967, New Brunswick received $767.9 thousand or $1.26 per person for vocational high school training. This was 5.4 per cent of what Canada paid out during the same period ($.74 per person).

ii) Technician Training Program--Program 2

The program establishing training for technicians was designed to assist in relieving a persistent shortage of technicians at the sub-professional level. Assistance was made available for post-secondary school training "that reaches an agreed standard of qualification in the principles of science or technology . . . except where such training is designed for university credit."[9] The program also provided for federal assistance for allowances to assist students who were taking full-time training.

The federal government provided the provinces with 50 per cent of the funds expended on this program. During the six years under review, this amounted to $37.4 million of which New Brunswick received $.5 million or 1.3 per cent. At the same time New Brunswick's population amounted to 3.2 per cent of Canada's population.

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[9]Canada, Department of Labour, Annual Report, 1963, p. 25.

iii) Trade and Other Occupational Training--Program 3

To provide pre-employment training or retraining for persons over the compulsory school attendance age who have left elementary or secondary school, this program was established to provide trade and occupational training. Instruction could be given in full-time, part-time, day or evening classes, by day or block release, or by correspondence courses.

Under this program, the federal government agreed to provide 50 per cent of all provincial expenditures. In Table A-10, it is seen that New Brunswick received $4.7 million over the six years under review. This was 6.5 per cent of the funds provided by the federal government.

iv) Training in Co-operation with Industry--Program 4

Program 4 was meant to consolidate previous training efforts in the area of "supervisory" training and to do this with the active support of industry. It was envisioned that provincial training authorities and the industries would join in arranging and financing the courses offered with the federal government sharing the expenditures to the extent of 50 per cent except in the following three types of programs, where the federal government contributed 75 per cent of the expenditures:

1. Basic training in mathematics, science, and communication skills for employed workers.

2. Industrial apprenticeship.

3. Retraining of employers who would otherwise be displaced because of technological or other industrial changes.

During 1963, the Small Business Management Training Program was transferred to the Department of Labour (to come under this agreement) from the Department of Trade and Commerce. It was really 1964 before the provinces moved into a position of promoting this type of training. For instance, in 1963, twenty-five projects were approved while in 1964, thirty-seven projects were approved. In 1964, the Small Business Management Training Program was conducted 325 times as against 98 times the previous year. It was this increase in promotion which caused the large increase in expenditures on this program in 1964-65.

New Brunswick was not a benefactor under this increase in expenditures. While Canada's payments increased thirty-eight times over the six years, New Brunswick's receipts decreased. While Canada's payments were $.12 per resident, New Brunswick's receipts were only $.05 per resident.

v) Training for the Unemployed--Program 5

Provision was made within the Act which allowed a federal contribution of 75 per cent of training costs for trainees selected jointly by provincial officials and the National Employment Service. These trainees were given short, intensive courses for occupations offering reasonable

chances of regular employment. In order to qualify for the 75 per cent contribution from the Federal government a minimum number of days of training had to be given. This qualification was later eliminated. In 1964, a federal contribution of 90 per cent of living allowances was started.

In the years 1961-63, New Brunswick received $1.8 million or 1.6 per cent of federal outlays for "Training for the Unemployed." During the same period, New Brunswick had a 169.4 per cent greater rate of unemployment than the Canadian average.[10]

vi) Training for the Disabled--Program 6

The Training for the Disabled Program provides for technical or vocational training, retraining or assessment of any person with a continuing disability, for a suitable occupation. The selection of those persons to be retrained was done by federal-provincial committees and costs were shared equally. It is interesting to note that this program permitted university training (the others permitting this were "Student Aid" and "Vocational Teacher Training").

Between 1961 and 1967, Canada paid out $4.0 million on this program of which New Brunswick received 4.8 per cent

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[10] No provincial breakdown of unemployment is available. This figure is the Atlantic Provinces composite figure which appears in Frank T. Denton and Sylvia Ostry, An Analysis of Post-War Unemployment, Staff Study No. 3 (Ottawa: Economic Council of Canada, 1964). The assumption is that New Brunswick does not differ greatly from the composite of the Atlantic Provinces.

or $190 thousand. That amounts to a payment by Canada of $.20 per capita or receipts for New Brunswick of $.31 per capita.

vii) Training of Vocational Teachers, Supervisors, and Administrators--Program 7

With the large increase in training facilities being promoted by the Technical and Vocational Training Agreement, it was feared that there would not be sufficient people to staff the facilities. The federal government agreed to pay the provinces 50 per cent towards operating costs and trainee assistance for the training of occupationally competent persons as teachers. Under this agreement the federal government paid New Brunswick $251.8 thousand out of a total of $3.0 million (8.5 per cent).

viii) Training for Federal Departments and Agencies--Program 8

Under the agreement there was provision for the federal government to reimburse the provinces for the full amount of their expenditures for training armed forces members in any occupation. Furthermore, 100 per cent of the cost of any training program operated by a province at the request of the federal government for training employees for a department or agency of the federal government was to be paid. During the six years under review, the federal government paid out $404.8 thousand while New Brunswick did not participate at any time.

ix) Student Aid--Program 9

It was noted under the discussion of the Vocational Training Co-ordination Act that "Student Aid" was carried on as a continuation of earlier acts. Again, it was included under the Technical and Vocational Training Assistance Act. As before, aid was for university students in degree-granting courses other than theology, and to nurses-in-training who were taking approved professional courses. A provincial selection committee selected the candidates to receive outright grants, loans, or a combination of both.

During the mid-sixties funds paid out by the federal government on this program fell by 38.5 per cent, indicating the increasing importance of other means of student support (Canada Council) which were not directed through provincial coffers. New Brunswick still received $60.7 thousand or 3.7 per cent of the $1.7 million paid out by the federal government during the years 1961 to 1967.

x) Technical and Vocational Correspondence Courses

This part of the agreement was a continuation of a program carried on under the Vocational Training Co-ordination Act and the provisions remained exactly the same. During the six years under review, the federal government paid out $108.8 thousand while New Brunswick received only 2.5 per cent of that ($2.7 thousand).

xi) Apprenticeship Training

The "Apprenticeship Training Program" was started under the Vocational Training Co-ordination Act in 1944. Like the other programs that started under the 1942 Act, few changes were made when the new Act was passed. Quebec and Prince Edward Island remained outside the agreement until a new agreement became effective on April 1, 1964 (to terminate on March 31, 1967) when Prince Edward Island became part of the agreement. Meanwhile apprentice training in Quebec was shared by the federal government under "Trade and Occupational Training--Program 3" and "Training for the Unemployed--Program 5." Under the latter 75 per cent of the funds were federally provided. Later, Quebec received funds under "Training in Co-operation with Industry--Program 4" which also provided 75 per cent of funds for industrial apprenticeship.

Funds for the "Apprenticeship Training Agreement" amounted to $9.5 million (excluding funds to Quebec) or $.11 per capita.[11] Over the six years, however, there was a decrease of 45.7 per cent in funds paid out. New Brunswick did not suffer this decline in funds. It actually received more in 1966-67 than in 1961-62. Of the $9.5 million paid out by Canada, New Brunswick received 6.6 per cent or $612.1 thousand ($1.00 per capita) over the six years under review.

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[11] The average population excluding Quebec was calculated from Canada, Dominion Bureau of Statistics, Vital Statistics (Ottawa: Queen's Printer, 1968), Table S-2.

xii) Capital Expenditure Program

Under the Capital Expenditure Program, the federal government agreed to aid in the provision of facilities for vocational training programs. Originally, the federal government agreed to reimburse the provinces for 75 per cent of approved capital expenditures incurred by March 31, 1963 (50 per cent after that date). This was also an attempt to create extra short-term employment in the construction industry during a period of high unemployment. In December, 1963 an amendment to the Act provided for the federal government paying 75 per cent of approved capital expenditures until the amount equalled $480 for each person in the 15-19 (inclusive) age group residing in the province as determined by the 1961 census. After $480 per eligible person had been paid, the federal government would contribute 50 per cent of approved costs.

New Brunswick was noticeably slow to use these funds. In the 1961 census, there were 53.5 thousand people in New Brunswick in the 15-19 year age group and by March 31, 1967 the payments to New Brunswick had amounted to $7.2 million or $133.96 per person in the relevant group. For Canada's 1.4 million people in this age group, $413.56 per person had been paid out in the same time period.

### 3. Veterans Rehabilitation Act[12]

In the Veterans Rehabilitation Act, 1945, provision was made for "the Minister [of Veterans Affairs] to pay him [the veteran who meets certain qualifications] an allowance for the period during which he takes the said [undergraduate] course."[13] Similar provisions were made for the veteran continuing his education in post-graduate courses.

As well,

> Where an allowance is being paid to a veteran under section 8, 9 or 11, or where such an allowance might be paid but for the provisions of section 17, the Minister may, in accordance with regulations, pay to any university, school or other similar institution, tuition fees, student fees, and athletic fees or other necessary charges and costs of courses of training approved under this Act for, and taken by such veteran, and pay costs of special tuition and training of such veteran received while under treatment in hospitals and similar institutions under authority contained in the Department of Veterans Affairs Act.[14]

and

> The Minister may, with the approval of the Governor in Council and subject to regulations, make a supplementary grant to any university for the purpose of assisting such university to meet expenses incurred in the training of veterans in respect of whom tuition fees are payable under this Act; . . .[15]

In the latter case an upper limit of $150 per veteran per year was established. Considerable sums of money

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[12] Canada, Veterans Rehabilitation Act, 1945, 9 Geo. VI, ch. 35.

[13] Ibid., sec. 9(1). Italics mine.

[14] Ibid., sec. 14(1).

[15] Ibid., sec. 14(4).

were paid to the universities under these supplementary grants which were the first large federal grants paid directly to the universities.

### 4. Children of War Dead (Education Assistance) Act[16]

In 1953, the federal government made provision for the education of those children whose father had been killed while in the armed services. Payments for the total cost or for part of the cost of education beyond matriculation were made through the Department of Veterans Affairs.

Table A-12 includes the payments made under the Veterans Rehabilitation Act and the Children of War Dead (Education Assistance) Act. Some of the figures in this table are estimates. Figures for the payments made by the federal government under both Acts were available. As well, a university breakdown was available for all payments over $2 thousand or $5 thousand (depending on the year). For the figures that were broken down, it was possible to arrive at a percentage going to New Brunswick institutions of higher learning. This percentage was then applied to the total federal grants to find the flow of funds to New Brunswick.

Two assumptions underlie this technique. First, it was assumed that smaller institutions did not receive enough funds to appear in the breakdown. Secondly, it was assumed

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[16] Canada, Children of War Dead (Education Assistance) Act, 1953, 1-2 Eliz. II, ch. 27.

TABLE A-12

PAYMENTS MADE UNDER VETERANS REHABILITATION ACT AND CHILDREN OF WAR DEAD (EDUCATION ASSISTANCE) ACT, 1946-1967
(In Thousands of Dollars)

| Year[a] (1) | Fees and Allowances Per Public Accounts[b] (2) | Supplementary Grants Per Public Accounts[b] (3) | Children of War Dead Per Public Accounts[b] (4) | Total Spent[c] (5) | Amount Accounted for in Public Accounts[b] (6) | Percentage of (6) Going to N.B.[b] (7) | Estimated Amount of Total Spent Going to N.B.[d] (8) |
|---|---|---|---|---|---|---|---|
| 1946 | $ 3,553 | $1,486 | . . | $ 5,039 | $ 1,449 | 2.02 | $102 |
| 1947 | 11,098 | 1,936 | . . | 13,034 | 10,562 | 5.78 | 753 |
| 1948 | 8,471 | 8,446 | . . | 16,916 | 16,341 | 3.65 | 617 |
| 1949 | . . | . . | . . | 24,737 | 9,936 | 2.89 | 428 |
| 1950 | . . | . . | . . | 16,766 | 6,286 | 2.58 | 270 |
| 1951 | . . | . . | . . | 9,209 | 3,048 | 1.59 | 146 |
| 1952 | . . | . . | . . | 3,785 | 930 | 1.77 | 67 |
| 1953 | . . | . . | . . | 1,600 | 306 | 1.37 | 22 |
| 1954 | . . | . . | . . | 798 | 180 | 3.96 | 32 |
| 1955 | . . | . . | . . | 516 | 154 | 4.52 | 23 |
| 1956 | . . | . . | . . | 372 | 118 | 7.85 | 29 |
| 1957 | . . | . . | . . | 332 | 115 | 9.28 | 31 |
| 1958 | . . | . . | . . | 301 | 102 | 8.27 | 25 |
| 1959 | 79 | . . | $289 | 368 | 130 | 9.93 | 37 |
| 1960 | 53 | . . | 378 | 430 | 170 | 7.16 | 31 |
| 1961 | 41 | . . | 464 | 505 | 180 | 9.14 | 46 |
| 1962 | 22 | . . | 560 | 582 | 222 | 7.54 | 44 |
| 1963 | 13 | . . | 648 | 662 | 229 | 2.82 | 19 |
| 1964 | 13 | . . | 732 | 745 | 303 | 6.33 | 47 |
| 1965 | 17 | . . | 774 | 790 | 292 | 7.00 | 55 |
| 1966 | 17 | . . | 930 | 947 | 297 | 6.71 | 64 |
| 1967 | 18 | . . | 832 | 850 | 291 | 5.02 | 43 |

[a]Fiscal year ending March 31.

[b]Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1946-67).

[c]Total of columns (2) to (4).

[d]Column (7) multiplied by column (5).

that New Brunswick had a ratio of small to large institutions that was not significantly different from the ratio in other provinces.

5. Fitness and Amateur Sport Act

The year 1961 was one of reflection for Canadian sports enthusiasts. President Kennedy was pushing physical fitness; Canada's hockey teams seemed to be leaving their domination of that sport to others; and Olympic performances of Canadian athletes had been less than a growing nationalism would allow. The result was a Fitness and Amateur Sport Act which permitted the federal government to provide funds which would promote and develop national and international sport.

Grants were given by the federal government for various functions including equipment, community recreational development, sports clinics, competitions, scholarships, and bursaries. There are two programs under which students are assisted. The first consists of scholarships and bursaries for undergraduates in physical education and recreation. The recipients are nominated by the province and the federal department pays the full cost. Students so nominated were free to pursue their education in other provinces.

Table A-13 shows the breakdown of funds for the Province of New Brunswick as well as the Canadian data. It

TABLE A-13

PAYMENTS MADE FOR UNDERGRADUATE SCHOLARSHIPS AND BURSARIES, 1963-1967

| Year[a] | Scholarships | | | Bursaries | | | Money Received by N.B. Nominees (000's) | Paid Out by Federal Government (000's) | N.B. as % of Canada |
|---|---|---|---|---|---|---|---|---|---|
| | No. to N.B. | No. in Canada | N.B. as % of Canada | No. to N.B. | No. in Canada | N.B. as % of Canada | | | |
| 1963 | . . | . . | . . | . . | 128 | . . | . . | $ 28.3 | . . |
| 1964 | 3 | 35 | 8.6 | 16 | 316 | 5.1 | $ 6.6 | 114.7 | 5.8 |
| 1965 | 2 | 30 | 6.7 | 17 | 453 | 3.5 | 6.5 | 126.3 | 5.1 |
| 1966 | 5 | 53 | 9.4 | 21 | 475 | 4.4 | 9.8 | 149.2 | 6.6 |
| 1967 | 3 | 61 | 4.9 | 23 | 525 | 4.4 | 7.2 | 154.0 | 4.7 |
| Total | 13 | 179 | 7.3 | 75 | 1,896 | 4.0 | $30.1 | $572.5 | 5.3 |

[a]Fiscal year ending March 31.

Source: Canada, Department of National Health and Welfare, Fitness and Amateur Sport Division, "Summary and Types of Projects Financed by Province" (various years, 1963-67). (Mimeographed.)

will be noted that New Brunswick nominees for the years under review received about 5.3 per cent of federal funds spent on this function.

TABLE A-14

FUNDS SPENT BY THE FEDERAL GOVERNMENT FOR POST-GRADUATE SCHOLARSHIPS AND FELLOWSHIPS IN PHYSICAL EDUCATION, 1963-1967[a]

| Year[b] | Amount Received by N.B. Residents (000's) | Amount Spent by Canada (000's) | New Brunswick as Percentage of Canada |
|---|---|---|---|
| 1963 | . . | $ 71.4 | . . |
| 1964 | $ 2.0 | 135.9 | 1.5 |
| 1965 | 5.2 | 162.7 | 3.2 |
| 1966 | 5.2 | 208.0 | 2.5 |
| 1967 | 0.9 | 188.7 | 0.5 |
| Total | $13.3 | $766.7 | 1.7 |

[a]Includes travel grants.

[b]Fiscal year ending March 31.

Source: Canada, Department of National Health and Welfare, Annual Report (Ottawa: Queen's Printer, various years, 1963-67), and figures supplied by Fitness and Amateur Sport Division, May 26, 1970.

The second type of support was "designed to provide assistance in continued improvement of professional competence of Canadian physical education teachers and recreation

leaders"[17] through post-graduate scholarships and fellowships. Applications were reviewed, in this case, by the Scholarship Committee of the National Advisory Council and the awards were given on the understanding that the recipient would work at least two years in Canada or for a period of time equal to the duration of their assisted studies. The universities in New Brunswick did not provide graduate work in physical education so recipients had to leave that province. The Department of National Health and Welfare assisted in the preparation of Table A-14 by providing the figures for students who had listed New Brunswick as their residence on applications.

6. Health Resources Fund Act

In 1964, the Royal Commission on Health Services recommended that the federal government support the construction of medical schools, nursing schools, university hospitals and other teaching facilities. The vehicle used by the federal government to do this was the Health Resources Fund Act, 1966. It provided for capital assistance in constructing, renovating and acquiring health training facilities and research institutions. The federal government was to provide 50 per cent of the costs of all basic equipment and the costs of planning and designing facilities up to

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[17] Canada, Department of National Health and Welfare, Annual Report (Ottawa: Queen's Printer, 1968), p. 153.

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$500 million (divided so that $300 million was allocated to the provinces on a per capita basis, $25 million was allocated for joint Atlantic Province projects, and $175 million was left undivided).

Because the Act was only proclaimed in July of 1966, the only figures relevant to this study are those from July, 1966 to March 31, 1967. During these first months, administrative details occupied the forefront. The first project was approved in February and payments were started in March. By March 31 the federal government had granted $4.7 million, of which New Brunswick's share was $308 thousand (New Brunswick medical education is taken at Dalhousie and the province's funds were allocated to a building on that campus).

7. Professional Training Grants

In 1948, the Health Grants Directorate of the Department of National Health and Welfare set up the administrative machinery to assess and process applications for provinces to help support training programs in various fields of health. Payments under "Professional Training Grants" were made on claims submitted by the provinces in accordance with rules set forth in the annual order-in-council. Funds for this function were provided for on an annual basis in the estimates of the Department of National Health and Welfare.

Table A-15 sets out the federal contributions claimed and paid out to the Province of New Brunswick as

TABLE A-15

FUNDS SPENT ON PROFESSIONAL TRAINING GRANTS, 1949-1967

| Year[a] | Paid Out by Federal Government (000's) | Received by New Brunswick (000's) | N.B. Receipts as a Percentage of Canadian Expenditures |
|---|---|---|---|
| 1949 | $ 232.4 | $ 21.2 | 9.1 |
| 1950 | 380.7 | 21.8 | 5.7 |
| 1951 | 452.9 | 21.4 | 4.7 |
| 1952 | 521.4 | 32.7 | 6.3 |
| 1953 | 604.9 | 24.1 | 4.0 |
| 1954 | 699.8 | 24.2 | 3.5 |
| 1955 | 655.8 | 20.0 | 3.1 |
| 1956 | 536.2 | 19.5 | 3.7 |
| 1957 | 515.6 | 18.9 | 3.7 |
| 1958 | 565.7 | 19.1 | 3.4 |
| 1959 | 617.4 | 19.0 | 3.1 |
| 1960 | 655.7 | 19.1 | 2.9 |
| 1961 | 1,290.5 | 71.7 | 5.6 |
| 1962 | 1,447.5 | 59.3 | 4.1 |
| 1963 | 1,511.7 | 51.6 | 3.4 |
| 1964 | 1,742.9 | 49.5 | 2.8 |
| 1965 | 1,933.4 | 60.3 | 3.1 |
| 1966 | 1,280.1 | 65.1 | 5.1 |
| 1967 | 1,448.0 | 62.4 | 4.3 |
| Total | $17,092.3 | $681.0 | 4.0 |

[a]Fiscal year ending March 31.

Source: Canada, Department of National Health and Welfare, Annual Report (Ottawa: Queen's Printer, various years, 1949-67).

well as total Canadian payments from the program's inception in 1948.

## 8. Welfare Assistance

The Department of National Health and Welfare conducts one other type of program to assist education. It is administered by the Welfare Assistance and Services Branch and includes three types of aid. University Schools of Social Work receive operating grants; provinces receive funds for individuals who are studying for social work degrees and who agree to take employment with the granting provincial government, and, as well, there is a fellowship and scholarship program on a nation-wide basis.[18]

Table A-16 sets forth the payments made to the Province of New Brunswick and to institutions and individuals in New Brunswick as well as the gross payments made by Canada. The New Brunswick figures for operating grants underestimate the value available to New Brunswick. That is, because the Maritime School of Social Work is situated in Nova Scotia, the figures on funds, flowing to that institution, are shown for Nova Scotia although the school could be considered a New Brunswick institution in the sense that it is a joint project of five Maritime universities to offer Master's courses only.

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[18] For complete information see Canada, Department of National Health and Welfare, Annual Report, 1967, pp. 178-79.

TABLE A-16

FUNDS PAID OUT FOR SOCIAL WORK TRAINING, 1948-1967

| Year[a] | Amount Received by New Brunswick (000's) | Amount Paid Out by Canada (000's) | N.B. Receipts as a Percentage of Total |
|---|---|---|---|
| 1948 | . . | $ 50.0 | . . |
| 1949 | . . | 50.0 | . . |
| 1950 | . . | 52.5 | . . |
| 1951 | . . | 52.5 | . . |
| 1952 | . . | 100.0 | . . |
| 1963 | $ 9.2 | 96.2 | 9.6 |
| 1964 | 9.4 | 169.6 | 5.5 |
| 1965 | 9.7 | 300.1 | 3.2 |
| 1966 | 11.2 | 352.4 | 3.2 |
| 1967 | 12.9 | 453.8 | 2.8 |
| Total | $52.4 | $1,677.1 | 3.1 |

[a]Fiscal year ending March 31.

Source: Canada, Department of National Health and Welfare, Annual Report (Ottawa: Queen's Printer, various years, 1948-67).

9. Medical Research Council

A subsidiary and separate council was formed by the National Research Council in 1960 to assist medical research which was not being already supported by the Defence Research Board and the Department of National Health and Welfare. Research by senior scientists connected with universities was supported by long-term (three-year) grants and annual grants. Purchase of research equipment by

university researchers was assisted by the Council but most important for the purposes of this paper was the support given training in medical research for superior graduate students through the Medical Research Fellowship Program. Lastly, the Council supported a number of full-time Medical Research Associates in Canadian universities.

Assistance was given on the basis of merit in the project as opposed to any regional determinant. Very few of the funds went to New Brunswick individuals and institutions. There are many reasons for this but the statement by the Executive Assistant to the President of the Council appears to explain the phenomenon:

> This is undoubtedly a reflection of the fact that there are no medical schools in the province and students and faculty members interested in research therefore tend to be oriented towards field[s] other than health sciences.[19]

The funds allocated by the Medical Research Council are shown along with those allocated by the National Research Council in Table A-17.

## 10. National Research Council

Originally established in 1916, the National Research Council has had from its inception a policy of assisting science in Canadian universities through scholarships and grants-in-aid of research. Although some

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[19] Correspondence from Dorothy J. Wright, August 12, 1969.

TABLE A-17

GRANTS UNDER MEDICAL RESEARCH COUNCIL AND NATIONAL RESEARCH COUNCIL, 1946-1967[a]

| Year[b] | Medical Research Council | | National Research Council | |
|---|---|---|---|---|
| | New Brunswick (thousands) | Canada (millions) | New Brunswick (thousands) | Canada (millions) |
| 1946 | . . | . . | $ 0.9 | $ 0.05 |
| 1947 | . . | . . | 1.5 | 0.08 |
| 1948 | . . | . . | 16.5 | 0.9 |
| 1949 | . . | . . | 20.1 | 1.1 |
| 1950 | . . | . . | 29.3 | 1.6 |
| 1951 | . . | . . | 32.9 | 1.8 |
| 1952 | . . | . . | 32.9 | 1.8 |
| 1953 | . . | . . | 38.4 | 2.1 |
| 1954 | . . | . . | 38.4 | 2.1 |
| 1955 | . . | . . | 40.3 | 2.2 |
| 1956 | . . | . . | 47.6 | 2.6 |
| 1957 | . . | . . | 67.7 | 3.7 |
| 1958 | . . | . . | 65.8 | 3.6 |
| 1959 | . . | . . | 111.6 | 6.1 |
| 1960 | . . | . . | 153.7 | 8.4 |
| 1961 | . . | $ 0.4 | 172.0 | 9.4 |
| 1962 | . . | 3.3 | 136.4 | 8.7 |
| 1963 | . . | 4.2 | 168.2 | 10.4 |
| 1964 | $ 5.0 | 5.1 | 218.5 | 12.6 |
| 1965 | 5.5 | 6.9 | 306.0 | 17.1 |
| 1966 | 9.9 | 12.3 | 531.1 | 21.9 |
| 1967 | 15.3 | 12.4 | 664.8 | 34.3 |

[a]Prior to 1962 the grants by the National Research Council to New Brunswick are estimated from the average percentage of grants going to New Brunswick, 1962-1967 inclusive.

[b]Fiscal year ending March 31.

Source: Canada, National Research Council of Canada, Annual Report (Ottawa: Queen's Printer, various years, 1946-67), and correspondence with Dorothy J. Wright, Executive Assistant to the President, Medical Research Council, and with F. A. Zuana, Awards Office, National Research Council of Canada.

institutional changes have been made through amendments, the basic statute has remained as the Research Council Act.[20]

Grants have been given on the basis of merit and have had no regional or geographic bias built into them. It will be noted that on a per capita basis, New Brunswick did not receive its full share of the grants, but that may be partly explained by the type of graduate programs offered in New Brunswick universities. The Council grants data appear in Table A-17.

### 11. Canada Council Act (1957)

The Canada Council was formed in the spring of 1957, after the passage of the Canada Council Act.[21] That Act provided for ". . . foster[ing] and promot[ing] the study and enjoyment of, and the production of works in, the arts, humanities, and social sciences . . ."[22] which the Council interpreted in as broad a way as possible. Programs were established to assist: (a) capital projects, (b) student programs (i.e., fellowships), (c) research grants, and (d) artists and groups providing performances. The first three items will be examined with respect to the assistance for institutions in New Brunswick.

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[20] Canada, Research Council Act, Revised Statutes of Canada, 1952, ch. 239 as amended.

[21] Canada, Canada Council Act, 1957, 5-6 Eliz. II, ch. 3.

[22] Ibid., sec. 8(1).

i) Capital Grants

The Act had allowed that the Council "make grants to universities and similar institutions of higher learning by way of capital assistance in respect of building construction projects."[23] Later in the same Act a "University Capital Grants Fund" was established with a sum of $50 million to be paid out such as to not exceed:

> a) in the case of any particular project one-half of the total expenditures made in respect of the project; and
>
> b) in any province, an amount that is in the same proportion to the aggregate of the amounts credited to the University Capital Grants Fund as the population of the province, according to the latest census, is to the aggregate population, according to such census . . . .[24]

In August, 1957, the Council announced that under this division of the University Capital Grants Fund, New Brunswick would be eligible to receive $1.7 million.[25] Table A-18 sets out the grants received by New Brunswick and paid out by Canada. It will be noted that the total was greater than the allotment. The reason for this was the interest division (also made on the basis of 1956 census figures) of which New Brunswick was eligible for $599 thousand.

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[23] Ibid., sec. 9.

[24] Ibid., sec. 17.

[25] Canada, Canada Council, Annual Report (Ottawa: Queen's Printer, 1958), p. 41.

TABLE A-18

CANADA COUNCIL CAPITAL GRANTS, 1958-1967
(In Thousands of Dollars)

| Year[a] | Amount Paid to New Brunswick | Amount Paid Out by Canada | N.B. Receipts as a Percentage of Canadian Payments |
|---|---|---|---|
| 1958 | $ 422 | $ 4,074 | 10.4 |
| 1959 | 710 | 8,732 | 8.1 |
| 1960 | 382 | 9,386 | 4.1 |
| 1961 | 109 | 3,374 | 3.2 |
| 1962 | 128 | 6,444 | 2.0 |
| 1963 | . . | 6,906 | . . |
| 1964 | 192 | 15,852 | 1.2 |
| 1965 | . . | 2,085 | . . |
| 1966 | 140 | 1,593 | 8.8 |
| 1967 | 31 | 8,746 | 0.4 |
| Total | $2,114 | $67,192 | 3.15 |

[a]Fiscal year ending March 31.

Source: Canada, Canada Council, Annual Report (Ottawa: Queen's Printer, various years, 1958-67).

ii) Library Research Collections

The Council recognized the need to be of general assistance to Canadian libraries, both university and public, but did not feel that the funds available were of sufficient size to carry out such a comprehensive program. The Council, however, did on occasion make grants to assist special library projects which could not be supported from local funds. Generally, the number of projects has been small but several

have been received by New Brunswick libraries. The values of such grants are set out in Table A-19.

iii) Scholarship and Fellowship Programs

The Council met with very heavy demand on its resources in the area of academic awards in the humanities and social sciences. Seventy-five per cent of the total funds allocated to scholarships, fellowships, and grants were allocated to programs such as Pre-Doctor's Degree Fellowships, Pre-Master's Degree Fellowships, and Grants-in-Aid of Research and Productive Scholarship. As the demand grew the programs changed. These were selected on the basis of merit "without regional consideration and regardless of whether they were French-speaking or English-speaking Canadians."[26]

As time progressed, the demand became so great that the Council gradually had to narrow down its field of activity and select from what they considered a "multitude of needs"[27] those which seemed most important. By 1962-63 that meant eliminating several categories (i.e., scholarships to train lawyers, architects, and librarians) and reducing others (i.e., Pre-Master's Degree Fellowships and non-resident awards). By 1965-66 the Pre-Master's Degree Fellowships were completely withdrawn.

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[26] Ibid., 1963, p. 7.

[27] See ibid., 1965, p. 3.

TABLE A-19

GRANTS MADE BY THE CANADA COUNCIL FOR SOCIAL SCIENCES AND HUMANITIES, 1958-1967
(In Thousands of Dollars)

| Year[a] | Pre-Master's Fellowships | | Doctoral Fellowships | | Leave Fellowships | | Research Fellowships | | Library Collections | | Visiting Scholars | | Total | | N.B. as a Percentage of Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N.B. | Canada | N.B. | Canada | N.B. | Canada | N.B. | Canada | N.B. | Canada | N.B. | Canada | N.B. | Canada | |
| 1958 | $1 | $ 91 | . . | $ 204 | . . | $ 66 | $3 | $ 86 | . . | . . | . . | . . | $ 4 | $ 447 | 0.9 |
| 1959 | 3 | 101 | $ 2 | 223 | . . | 104 | 4 | 97 | . . | . . | $5 | $35 | 14 | 560 | 2.5 |
| 1960 | 3 | 100 | 4 | 241 | $13 | 104 | 2 | 95 | . . | . . | . . | 30 | 22 | 570 | 3.9 |
| 1961 | 4 | 115 | 8 | 276 | 13 | 132 | 5 | 224 | . . | . . | 3 | 35 | 33 | 782 | 4.2 |
| 1962 | 3 | 130 | 8 | 322 | 4 | 115 | 2 | 220 | . . | $ 60 | 1 | 26 | 18 | 873 | 2.1 |
| 1963 | 5 | 95 | 15 | 420 | 9 | 152 | 6 | 226 | . . | 45 | 2 | 45 | 37 | 983 | 3.8 |
| 1964 | . . | 45 | 11 | 489 | 5 | 166 | 3 | 199 | . . | 45 | 2 | 47 | 21 | 991 | 2.1 |
| 1965 | . . | . . | 13 | 695 | . . | 177 | 6 | 203 | . . | 45 | 4 | 43 | 23 | 1,163 | 2.0 |
| 1966 | . . | . . | 14 | 1,181 | 25 | 305 | 7 | 412 | $20 | 565 | . . | 53 | 66 | 2,516 | 2.6 |
| 1967 | . . | . . | 65 | 2,931 | 30 | 617 | 6 | 983 | 20 | 500 | . . | 45 | 121 | 5,076 | 2.4 |

[a]Fiscal year ending March 31.

Source: Canada, Canada Council, Annual Report (Ottawa: Queen's Printer, various years, 1958-67).

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The fellowship programs are set out in Table A-19 along with the library collection grants. It will be noted that in both programs New Brunswick received a smaller share of the funds allotted than they would have had they been allocated by population. This is not surprising when the structure of post-graduate education in New Brunswick is examined.

iv) Leave Fellowships

These fellowships are available to career scholars who obtain leaves from universities for periods of free study and research. They have involved a stipend, travel expenditures, and a small sum for research costs. This program also has evolved over the years of the Council's existence and the magnitude of the program can be found in Table A-19. It will be noted again that these fellowships were granted on merit rather than on region.

v) Research Grants

The Research Grants Program was started in the fall of 1965 and demand at first was small, but it increased rapidly so that in 1966-67 close to $1 million was spent on over 300 projects. The breakdown for this program can be found in Table A-19 and there it can be seen that it, along with the other Council programs, is non-regional--being based on merit.

vi) Visiting Scholars

The last major program which assists the educational system in New Brunswick is the Visiting Scholars Program. It was designed to "bring eminent foreign scholars to do special work in their graduate schools [Canadian universities]"[28] and proved to be a very modest form of assistance. The breakdown can again be found in Table A-19.

12. Per Capita University Grants

In 1951, the Royal Commission on National Development in the Arts, Letters and Sciences[29] recommended that the federal government make annual contributions to operating budgets of universities on the basis of provincial population.[30] Almost immediately, the federal government started grants of $.50 per capita to the provinces which was distributed to the universities on the basis of enrollment.

The per capita grant was raised to $1.00 per head in 1956-57. At the same time, because of the difficulties encountered by the federal Department of Finance in distributing these grants,[31] the responsibility for distribution

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[28] Ibid., 1963, p. 11.

[29] Canada, Royal Commission on National Development in the Arts, Letters and Sciences, Report (Ottawa: Queen's Printer, 1951). This is commonly referred to as the Massey Commission.

[30] Ibid., p. 355.

[31] In particular, the Province of Quebec was rejecting these grants on the basis that they represented federal interference in a provincial jurisdiction.

TABLE A-20

GRANTS MADE BY THE FEDERAL GOVERNMENT FOR UNIVERSITY OPERATING EXPENDITURES, 1952-1967
(In Thousands of Dollars)

| Year[a] | Paid Out by Canada[b] | Received by New Brunswick[c] | New Brunswick Receipts as a Percentage of Total Funds |
|---|---|---|---|
| 1952 | $ 6,992.0 | $ 257.8 | 3.7 |
| 1953 | 9,290.0 | 263.9 | 2.8 |
| 1954 | 9,513.0 | 268.0 | 2.8 |
| 1955 | 9,778.0 | 273.5 | 2.8 |
| 1956 | 10,043.5 | 279.0 | 2.8 |
| 1957 | 16,049.3 | 554.6 | 3.5 |
| 1958 | 16,558.0 | 565.0 | 3.4 |
| 1959 | 25,522.5 | 865.5 | 3.4 |
| 1960 | 26,112.0 | 885.0 | 3.4 |
| 1961 | 24,114.0 | 898.9 | 3.7 |
| 1962 | 26,926.1 | 879.7 | 3.3 |
| 1963 | 26,330.0 | 1,058.3 | 4.0 |
| 1964 | 26,778.0 | 1,227.9 | 4.6 |
| 1965 | 27,264.0 | 1,234.3 | 4.5 |
| 1966 | 27,748.0 | 1,246.0 | 4.5 |
| 1967 | 87,053.0 | 3,704.0 | 4.3 |

[a]Fiscal year ending March 31.

[b]Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1951-67). Until 1962, this column includes payments made in lieu of grants to the government of Quebec. From 1963 to 1967, Quebec received tax points which are not shown.

[c]Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1952-56); Canada, Dominion Bureau of Statistics, Survey of Higher Education, 1954-1961 (Ottawa: Queen's Printer, 1962); and Association of Universities and Colleges of Canada (unpublished tables for the years 1958-1967 inclusive).

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was shifted to the Association of Universities and Colleges of Canada.

The per capita grants were raised in 1958-59 to $1.50 per head and again in 1962-63 to $2.00 per head. In 1966-67 an average supplementary grant of $3.00 per capita was approved (part of this being for out-of-province students). A record of the payments made by Canada and received by New Brunswick is found in Table A-20.

### 13. Other Funds

There were a number of other grant programs which provided educational subsidies from federal authorities. Some of these were in the nature of grants while others were funds spent directly by the federal government.

#### i) ARDA

The first of these funds were provided through the Agricultural and Rural Development Act, 1961.[32] There were two ARDA agreements between the provinces and the federal government. The first was known as the First General Agreement and was in force from June, 1962 to March, 1965. The second, known as the Federal-Provincial Rural Development Agreement, began in April, 1965. During the first agreement,

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[32] Canada, Agricultural Rehabilitation and Development Act, 1961, 9-10 Eliz. II, ch. 30, which later was amended to become the Agricultural and Rural Development Act, 1966, 14-15 Eliz. II, ch. 11. Referred to from this point as ARDA.

$13 million was spent by the federal government on improved management and use of resources.[33] The second agreement shifted the emphasis to the social and economic needs of the people in rural areas. The second agreement was broken into eight parts, several of which might have included education. They were:[34]

Part I: Research
Part II: Land Use and Farm Agreement
Part III: Rehabilitation
Part IV: Redevelopment Staff and Training Service
Part V: Rural Development Areas
Part VI: Special Rural Development Areas
Part VII: Public Information Service
Part VIII: Soil and Water Conservation

The classifications do not lend themselves to any easy breakdown of the expenditures by function but through correspondence with R. E. M. Routledge, Rural Development Office in New Brunswick, it was possible to get some estimate of the expenditures made in the 1966-67 fiscal year for education.[35] These were then calculated as a percentage of

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[33]Canada, Department of Forestry, Agricultural and Rural Development Act, Annual Report (Ottawa: Queen's Printer, 1966), p. 1

[34]Ibid., p. 2.

[35]The projects estimated to be educational in nature were:
#4016 Residential Adult Education
#23009 Assistance to Regional Development Organizations
#23020 Rural Development Staff and Training Services.

total federal contributions to calculate the amount going towards education in 1965-66 under the second agreement.

TABLE A-21

PAYMENTS MADE TO NEW BRUNSWICK UNDER ARDA AGREEMENTS, 1963-1967
(In Thousands of Dollars)

| Year[a] | Paid Out by Canada | Received by New Brunswick | Estimate of Amount to Education in New Brunswick |
|---|---|---|---|
| 1963 | $ 560.1 | $ 62.1 | . . |
| 1964 | 3,972.4 | 103.3 | . . |
| 1965 | 8,581.9 | 364.0 | . . |
| 1966 | 12,138.6 | 442.8 | $56.8 |
| 1967 | 16,075.4 | 596.6 | 76.5 |

[a]Fiscal year ending March 31.

Source: Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, 1963, 1964), and Canada, Department of Forestry, Agricultural and Rural Development Act, Annual Report (Ottawa: Queen's Printer, 1965, 1966, 1967).

It has already been noted that the first agreement was oriented towards social or economic functions and, for that reason, funds paid out under the first agreement have not been estimated for there is very little likelihood of them having been applied to education. The categories under the first agreement were broken down into the following classifications:

1. Shared Research

2. Rural Development
3. Alternate Land Use
4. Community Pastures
5. Soil and Water

The data available are supplied in Table A-21 where it becomes evident that even with the large sums of money committed to ARDA, the education system of New Brunswick received only a small fraction of those funds. It also becomes evident that for large commitments of money on a broad social basis (such as ARDA), a better accounting of expenditures should be required. In the present system used for accounting by ARDA, there is no possibility of observing whether a particular function (i.e., education) is contributing its share to the total project.

ii) Canada Student Loans

The second "other" source of federal subsidy to education in New Brunswick was the Canada Student Loan Act, 1964.[36] Under this Act, the province could authorize loans in aggregate up to an allocated loan provision which was contained in the Act. The allocation was on the basis of population in the 18-24 year age group. From the start of the program supplementary allocations were made to several provinces. New Brunswick received these supplementary

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[36]Canada, Canada Student Loans Act, 1964, 13 Eliz. II, ch. 24.

grants in 1965-66 and 1966-67 as is noted in Table A-22.

Table A-22 does not show the subsidy value for New Brunswick education. The figures shown are loan values. The real value of the subsidy is the payment of interest on the loan until after the graduation of the student. Because of the branch banking system in Canada, there is no way to allocate these interest payments as to their multiplier effect within a given province.

TABLE A-22

LOANS UNDER CANADA STUDENT LOAN ACT
FOR NEW BRUNSWICK, 1965-1967
(In Thousands)

| Year[a] | Number of Students to Whom Certificates were Issued | Amount | Provincial Allocation |
|---|---|---|---|
| 1965 | 2.0 | $1,356.0 | $1,416.0 |
| 1966 | 3.2 | 2,339.6 | 2,100.0<br>350.0[b] |
| 1967 | 4.0 | 3,041.5 | 2,194.0<br>984.0[b] |

[a]Academic year ending in the spring.

[b]Supplementary appropriation.

Source: Canada, Department of Finance, Canada Student Loans Plan: Annual Report (Ottawa: Queen's Printer, various years, 1965-67), Table A.

On the other hand, there is an expenditure multiplier effect immediately, both within the educational system (tuition) and the community (housing, food, and other

expenditures). These effects are more likely to be felt within the province with various factors decreasing their effect.[37]

iii) Indian Education

Since 1867, the federal government has had the responsibility for the provision of public goods for Indians.[38] This responsibility included the provision of schooling which in some areas involved residential schools where the population was sparse and widely spread geographically.

The Departments[39] which have had the responsibility for Indian Affairs have not undertaken to do their accounting on a provincial basis. A method of estimating the expenditures for New Brunswick was, therefore, necessary.

The method used in Table A-23 was based on the percentage of Indians residing in New Brunswick, which implies that Indian education costs the same per pupil in all parts of Canada. As well, there is an implication that the age

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[37]These factors would include the negative multiplier when the loan was paid back, interregional and international trade, and mobility of the student population.

[38]Great Britain, British North America Act, 1867, 30-31 Victoria, ch. 3, sec. 91.

[39]These included the Department of Mines and Resources, Department of Citizenship and Immigration, Department of Northern Affairs and National Resources, and the Department of Indian Affairs and Northern Development.

TABLE A-23

AMOUNT OF FEDERAL PAYMENTS FOR INDIAN EDUCATION, 1945-1967

| Year[a] | Amount Spent by Federal Government[b] (millions) | Estimated Amount Spent in New Brunswick[c] (thousands) |
|---|---|---|
| 1945 | $ 2.1 | $ 34.4 |
| 1946 | 2.3 | 36.6 |
| 1947 | 2.5 | 40.6 |
| 1948 | 3.5 | 57.6 |
| 1949 | 2.2 | 35.7 |
| 1950 | 3.7 | 58.5 |
| 1951 | 7.4 | 118.1 |
| 1952 | 5.4 | 87.0 |
| 1953 | 6.3 | 106.7 |
| 1954 | 6.7 | 114.0 |
| 1955 | 7.6 | 130.0 |
| 1956 | 9.3 | 158.9 |
| 1957 | 10.8 | 194.0 |
| 1958 | 11.9 | 214.5 |
| 1959 | 16.0 | 287.2 |
| 1960 | 17.6 | 316.0 |
| 1961 | 19.9 | 358.8 |
| 1962 | 21.7 | 390.9 |
| 1963 | 23.1 | 415.8 |
| 1964 | 25.5 | 459.4 |
| 1965 | 28.9 | 520.3 |
| 1966 | 34.6 | 623.4 |
| 1967 | 40.8 | 734.5 |

[a]Fiscal year ending March 31.

[b]Canada, Department of Finance, Public Accounts (Ottawa: Queen's Printer, various years, 1945-67).

[c]Estimated by allocating education expenditures according to the percentage of Indians residing in New Brunswick. The percentage of Indians living in New Brunswick was calculated from "Residential Distribution of Indians by Provinces" supplied by the Central Statistics Division, Department of Indian Affairs and Northern Development, for various years. (Mimeographed.)

distribution of Indians is the same in all provinces. In spite of these implications, this method of estimation seemed most reasonable.

Table A-23 points out the large increase in expenditures on this function--a more than twentyfold expansion, half of this taking place in the last five years under review.

iv) Customs and Excise Rebates

In the Excise Tax Act,[40] section 47a states:

> Where materials have been purchased by or on behalf of
> a) school, university or other similar educational institution for use exclusively in the construction of a building for that institution,
> b) any organization for use exclusively in the construction of a building for that organization that is to be used exclusively or mainly as a public library operated on or on behalf of that organization on a non-commercial basis, or
> c) a corporation wholly owned and controlled by Her Majesty in right of a province that is established for the sole purpose of providing residences for students of universities or other similar educational institutions, for use exclusively in the construction of such residences,
>
> and the tax imposed by Part VI has been paid in respect of those materials, the Minister may, upon application by such institution, organization, or corporation in such form as the Minister prescribes made to the Minister within two years from the time the materials were purchased, pay to such institution, organization, or corporation an amount equal to that tax.[41]

Since payments under the first part of this section have been made for a number of years, an attempt was made to

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[40] Canada, Excise Tax Act, Revised Statutes of Canada, 1952, ch. 100, sec. 47a as amended.

[41] Ibid.

TABLE A-24

REFUNDS TO EDUCATIONAL INSTITUTIONS OF EXCISE TAX, 1967-1970

| Province | 1967 | | 1968 | | 1969 | | 1970 | |
|---|---|---|---|---|---|---|---|---|
| | Thousands | % | Thousands | % | Thousands | % | Thousands | % |
| Newfoundland | $ 100.9 | 0.5 | $ 520.2 | 2.4 | $ 1,020.8 | 3.8 | $ 153.8 | 0.6 |
| Prince Edward Island | 45.0 | 0.2 | 141.3 | 0.6 | 80.3 | 0.3 | 103.4 | 0.4 |
| Nova Scotia | 233.8 | 1.1 | 814.2 | 3.9 | 1,036.4 | 3.9 | 1,298.9 | 4.8 |
| New Brunswick | 459.5 | 2.2 | 513.0 | 2.4 | 699.7 | 2.6 | 1,103.8 | 4.1 |
| Quebec | 2,502.1 | 12.2 | 3,185.1 | 15.2 | 3,332.0 | 12.4 | 5,296.2 | 19.5 |
| Ontario | 12,962.2 | 63.0 | 9,977.0 | 47.6 | 14,782.3 | 55.0 | 12,826.0 | 47.3 |
| Manitoba | 182.7 | 0.8 | 137.4 | 0.7 | 153.8 | 0.6 | 183.6 | 0.7 |
| Saskatchewan | 1,119.1 | 5.4 | 1,422.8 | 6.8 | 985.0 | 3.7 | 1,307.0 | 4.8 |
| Alberta | 1,679.2 | 8.2 | 2,426.2 | 11.6 | 2,761.4 | 10.3 | 3,249.5 | 12.0 |
| British Columbia | 1,300.1 | 6.3 | 1,821.6 | 8.7 | 2,015.2 | 7.5 | 1,580.0 | 5.8 |
| Canada | $20,584.5 | 100.0 | $20,958.7 | 100.0 | $26,866.9 | 100.0 | $27,102.1 | 100.0 |

Source: Correspondence from R. J. Neville, Chief, Excise Tax Audit, December 29, 1970.

discover the rebates to institutions in New Brunswick. Because the payments decreased gross revenue, they are not specifically accounted for in the Public Accounts and therefore the Department itself was asked for figures. They were able to supply the figures shown in Table A-24.

v) Department of National Defence

The Department undertakes responsibility to provide for the education of dependents' children wherever the services member is stationed. In Canada, arrangements vary according to the circumstances. Where the defence station is not adjacent to any publicly-operated schools, schools are built and operated on the station by the Department. These schools follow the curriculum of the province in which they are situated. When there are schools adjacent to the defence station, the Department prefers to have the service children attend that school. Fees are paid, based on per pupil cost, or the Department of Finance makes an annual grant in lieu of taxes. The Department of National Defence also participates in the construction of new schools on the basis of the proportion of service children expected to attend the completed school.

## 14. Summary and Conclusion

There is much that could be said about the various programs which are summarized in Table A-25. One comment would deal with the increase in the size of the grants.

TABLE A-25

SUMMARY OF FEDERAL GRANTS FOR EDUCATION
TO NEW BRUNSWICK, 1946-1967
(In Thousands of Dollars)

| | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 |
|---|---|---|---|---|---|---|
| Table A-1 | $520.2 | $ 953.9 | $ 527.9 | $341.1 | $589.5 | $230.4 |
| A-10 | . . | . . | . . | . . | . . | . . |
| A-12 | 102.0 | 753.0 | 617.0 | 428.0 | 270.0 | 146.0 |
| A-13 | . . | . . | . . | . . | . . | . . |
| A-14 | . . | . . | . . | . . | . . | . . |
| A-15 | . . | . . | . . | 21.2 | 21.8 | 21.4 |
| A-16 | . . | . . | . . | . . | . . | . . |
| A-17 | 0.9 | 1.5 | 16.5 | 20.1 | 29.3 | 32.9 |
| A-18 | . . | . . | . . | . . | . . | . . |
| A-19 | . . | . . | . . | . . | . . | . . |
| A-20 | . . | . . | . . | . . | . . | . . |
| A-21 | . . | . . | . . | . . | . . | . . |
| A-22[a] | . . | . . | . . | . . | . . | . . |
| A-23[a] | 36.6 | 40.6 | 57.6 | 35.7 | 58.5 | 118.1 |
| A-24[a] | b | b | b | b | b | b |
| Total | $623.1 | $1,708.4 | $1,161.4 | $810.4 | $910.6 | $430.7 |
| Population[c] | 478.0 | 488.0 | 498.0 | 508.0 | 512.0 | 516.0 |
| Per Capita[d] | $1.30 | $3.50 | $2.33 | $1.60 | $1.78 | $0.83 |
| Additional[a] | $36.6 | $40.6 | $57.6 | $35.7 | $58.5 | $118.1 |
| DBS[e] | . . | . . | . . | . . | . . | . . |

[a]Items which are not grants but which act as a support to total education in New Brunswick.

[b]Data not available but program in operation.

[c]In thousands of people.

[d]In dollars.

[e]Canada, Dominion Bureau of Statistics, Survey of Education Finance (Ottawa: Queen's Printer, various years, 1958-66), Table 4.

Source: Other tables in the appendix.

TABLE A-25--Continued

| | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 |
|---|---|---|---|---|---|---|
| Table A-1 | $271.6 | $240.8 | $225.4 | $247.1 | $231.7 | $247.1 |
| A-10 | . . | . . | . . | . . | . . | . . |
| A-12 | 67.0 | 22.0 | 32.0 | 23.0 | 29.0 | 31.0 |
| A-13 | . . | . . | . . | . . | . . | . . |
| A-14 | . . | . . | . . | . . | . . | . . |
| A-15 | 32.7 | 24.1 | 24.2 | 20.0 | 19.6 | 18.9 |
| A-16 | . . | . . | . . | . . | . . | . . |
| A-17 | 32.9 | 38.4 | 38.4 | 40.3 | 47.6 | 67.7 |
| A-18 | . . | . . | . . | . . | . . | . . |
| A-19 | . . | . . | . . | . . | . . | . . |
| A-20 | 257.8 | 263.0 | 268.0 | 273.5 | 279.0 | 554.6 |
| A-21 | . . | . . | . . | . . | . . | . . |
| A-22[a] | . . | . . | . . | . . | . . | . . |
| A-23[a] | 87.0 | 106.7 | 114.0 | 130.0 | 158.9 | 194.0 |
| A-24[a] | b | b | b | b | b | b |
| Total | $662.0 | $588.3 | $588.0 | $603.9 | $601.4 | $919.3 |
| Population[c] | 526.0 | 533.0 | 540.0 | 547.0 | 555.0 | 562.0 |
| Per Capita[d] | $1.26 | $1.10 | $1.09 | $1.10 | $1.08 | $1.64 |
| Additional[a] | $87.0 | $106.7 | $114.0 | $130.0 | $158.9 | $194.0 |
| DBS[e] | . . | . . | . . | . . | . . | . . |

TABLE A-25--Continued

| | 1958 | 1959 | 1960 | 1961 | 1962 |
|---|---|---|---|---|---|
| Table A-1 | $ 277.3 | $ 359.3 | $ 423.4 | $ 992.3 | . . |
| A-10 | . . | . . | . . | . . | $1,562.6 |
| A-12 | 25.0 | 37.0 | 31.0 | 46.0 | 44.0 |
| A-13 | . . | . . | . . | . . | . . |
| A-14 | . . | . . | . . | . . | . . |
| A-15 | 19.1 | 19.0 | 19.1 | 71.7 | 59.3 |
| A-16 | . . | . . | . . | . . | . . |
| A-17 | 65.8 | 111.6 | 153.7 | 172.0 | 136.4 |
| A-18 | 422.0 | 710.0 | 882.0 | 109.0 | 128.0 |
| A-19 | 4.0 | 14.0 | 22.0 | 33.0 | 18.0 |
| A-20 | 565.0 | 865.5 | 885.0 | 898.9 | 879.7 |
| A-21 | . . | . . | . . | . . | . . |
| A-22[a] | . . | . . | . . | . . | . . |
| A-23[a] | 214.5 | 287.2 | 316.0 | 358.8 | 390.9 |
| A-24[a] | b | b | b | b | b |
| Total | $1,378.2 | $2,116.4 | $1,916.2 | $2,322.9 | $2,828.0 |
| Population[c] | 571.0 | 582.0 | 589.0 | 598.0 | 605.0 |
| Per Capita[d] | $2.41 | $3.64 | $3.25 | $3.88 | $4.67 |
| Additional[a] DBS[e] | $214.5 | $287.2 | $316.0 | $358.8 | $390.9 |
| | $1,708.0 | $2,866.0 | $2,768.0 | $2,180.0 | $2,454.0 |

TABLE A-25--Continued

| | 1963 | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|
| Table A-1 | . . | . . | . . | . . | . . |
| A-10 | $2,622.8 | $2,259.7 | $3,984.3 | $1,848.0 | $3,863.4 |
| A-12 | 19.0 | 47.0 | 55.0 | 64.0 | 43.0 |
| A-13 | . . | 6.6 | 6.5 | 9.8 | 7.2 |
| A-14 | . . | 2.0 | 5.2 | 5.2 | 0.9 |
| A-15 | 51.6 | 49.5 | 60.3 | 65.1 | 62.4 |
| A-16 | 9.2 | 9.4 | 9.7 | 11.2 | 12.9 |
| A-17 | 168.2 | 223.5 | 311.5 | 541.0 | 680.1 |
| A-18 | . . | 192.0 | . . | 140.0 | 31.0 |
| A-19 | 37.0 | 21.0 | 23.0 | 66.0 | 121.0 |
| A-20 | 1,058.3 | 1,227.9 | 1,234.3 | 1,246.0 | 3,704.0 |
| A-21 | . . | . . | . . | 56.8 | 76.5 |
| A-22[a] | . . | . . | 1,356.0 | 2,339.6 | 3,041.5 |
| A-23[a] | 415.8 | 459.4 | 520.3 | 623.4 | 734.5 |
| A-24[a] | b | b | b | b | 459.5 |
| Total | $3,966.1 | $4,038.6 | $5,689.8 | $4,053.1 | $8,602.4 |
| Population[c] | 609.0 | 611.0 | 615.0 | 617.0 | 619.0 |
| Per Capita[d] | $6.51 | $6.61 | $9.25 | $6.57 | $13.90 |
| Additional[a] DBS[e] | $415.8 $1,963.0 | $459.4 $2,229.0 | $1,876.3 $2,812.0 | $2,963.0 $2,838.0 | $4,235.5 . . |

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From $1.30 per capita to $13.90 per capita is a large increase, demonstrating the increasing importance of education and the increasing participation of the federal government in the functions of education. It might be argued that because these figures are in current dollars, the figures overstate the increase in expenditures on education. In constant dollars the increase would be smaller.

Secondly, it is noted that the programs which are not supported by grants (tax rebates, loans, etc.) gained in importance during the latter half of the period under review. This was particularly the case during the latter half of the period in which the Pearson government was in Ottawa. This change has become more significant since 1967 with the shift in university operating grants to a new basis involving tax rebates.

An examination of Table A-25 does not readily indicate the complicated nature of deriving the figures. Many of the federal programs are accounted for only on a gross basis. For a government increasingly interested in regional implications of federal programs, there should be an active push towards accounting both by function and by geographical area. This does not contradict the movement to performance and program budgeting which is a stated objective of the present government.[42] In fact, one of the advantages of

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[42]Benson, "Budget Breakthrough," pp. 161-67.

program budgeting is supposed to be its usage in determination of how much each function contributes to the complete program.[43] The ARDA program is an excellent example of how PPB budgeting could be used more effectively. The programs outlined in the second agreement are broad while within each broad function, specific functions such as retraining (education) could be carried out. No analysis seems to have been done which would indicate the contribution of component functions to the total program purpose and in fact any analysis is stifled by the accounting system used for public purposes.

It will be noted that comparative data from Statistics Canada has been provided for the years in which that was available. Some differences will be noted. First, Table A-25 does not include expenditures for the Department of National Defence while Statistics Canada distributed these experditures to the provinces in some years and includes them in a category "Overseas and Undistributed" in other years. The Department of National Defence does not account for their expenditures by province which explains their absence from Table A-25.

The second aspect in which Statistics Canada data differ from Table A-25 is that Table A-25 constitutes a broad definition of education while Statistics Canada has

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[43] Herber, Modern Public Finance, pp. 116-17.

defined their data to deal with "Formal Education" only, which they define as follows:

> . . . all elementary and secondary education, teacher-training and higher education in universities and colleges. It accounts for all but 7 p.c. of total educational expenditure in Canada.[44]

The broader definition used in Table A-25 is useful in discussing the role of the federal government in the total education picture for the federal government has tended to avoid interference in the "formal education" function, partly due to the BNA Act restrictions. The result is that the Statistics Canada figures have tended (particularly in recent years) to understate the federal role in education expenditures.

In 1967, the federal government changed the financing arrangements for post-secondary education in the Federal-Provincial Arrangements Act (Part II).[45] This Act provided for a fiscal transfer to each province of equalized tax abatements (4 per cent of basic individual income tax and 1 per cent of corporation taxable income) and a cash payment of either $15 per capita (escalated annually according to the national growth rate of post-secondary education operating expenditures) or 50 per cent of post-secondary

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[44]Canada, Dominion Bureau of Statistics, Survey of Education Finance, 1965, p. 14.

[45]Canada, Federal-Provincial Arrangements Act (Part II), 1966-67, 15-16 Eliz. II, ch. 89.

education operating expenditures incurred in the province.[46] Although conditional grants to the provinces under the Technical and Vocational Assistance Act, 1961 were scheduled to expire in 1967, interim arrangements were made to allow provinces to exhaust $800 per capita of the population aged fifteen to nineteen in 1961 in capital grants. As well, the federal government agreed to take over the full cost of training allowances and programs for the occupational training of adults.

Although this review of recent arrangements is necessarily brief, it is indicative of the fact that the federal government did not feel free to abandon what had been established between 1946-67. What it does constitute is a movement away from strictly controlled conditions while maintaining one major condition--that the grants be adjusted according to increases in post-secondary education spending. The recent arrangements do not, therefore, change the basic direction of this study.

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[46]Post-secondary education is defined as "any course of more than 24 weeks which requires the attainment of junior matriculation for admission and which has been certified . . ." and the operating expenditures are defined to exclude all capital expenses, student financial aid, and certain ancillary services.

## APPENDIX B

## NEW BRUNSWICK: A PROFILE

In order to gain a full understanding of the hypothesis advanced in this dissertation, it is necessary to bring together a number of economic and demographic characteristics of the Province of New Brunswick. Of primary importance are the people who live there. Several characteristics of the people will aid in understanding the province--including age profiles, educational attainments, occupational breakdowns, and a breakdown of industrial structure. Secondly, there is an interest in the geographical characteristics of the province, including natural resource endowments (the distribution of the population within the province, etc.). Finally, of major importance is the income profile for New Brunswick as compared with other provinces.

### 1. The People

Numerous characteristics of the population are relevant to any discussion of educational expenditures made by and for that province. The federal government tends to take into account only two, namely, the total population living within a given jurisdiction in a given year and the total number in any given age group residing within the province.

TABLE B-1

TOTAL POPULATION: NEW BRUNSWICK AND CANADA, 1946-1967
(In Thousands of People)

| Year[a] | New Brunswick | Canada | New Brunswick as a Percentage of Canada |
|---|---|---|---|
| 1946 | 478 | 12,292 | 3.9 |
| 1947 | 488 | 12,551 | 3.9 |
| 1948 | 498 | 12,823 | 3.9 |
| 1949 | 508 | 13,447 | 3.8 |
| 1950 | 512 | 13,712 | 3.7 |
| 1951 | 516 | 14,009 | 3.7 |
| 1952 | 526 | 14,459 | 3.6 |
| 1953 | 533 | 14,845 | 3.6 |
| 1954 | 540 | 15,287 | 3.5 |
| 1955 | 547 | 15,698 | 3.5 |
| 1956 | 555 | 16,081 | 3.5 |
| 1957 | 562 | 16,610 | 3.4 |
| 1958 | 571 | 17,080 | 3.3 |
| 1959 | 582 | 17,483 | 3.3 |
| 1960 | 589 | 17,870 | 3.3 |
| 1961 | 598 | 18,238 | 3.3 |
| 1962 | 605 | 18,583 | 3.3 |
| 1963 | 609 | 18,931 | 3.2 |
| 1964 | 611 | 19,290 | 3.2 |
| 1965 | 615 | 19,644 | 3.1 |
| 1966 | 617 | 20,015 | 3.1 |
| 1967 | 619 | 20,405 | 3.0 |

[a]Population statistics are for June 1.

Source: Canada, Dominion Bureau of Statistics, Canadian Statistical Review: Supplement (Ottawa: Queen's Printer, 1963), Table 2, and Canada, Dominion Bureau of Statistics, Census Division, Research Section, Estimated Population of Canada (Ottawa: Queen's Printer, various years, 1946-67).

Table B-1 sets out the population for New Brunswick, both in terms of absolute numbers and as a percentage of Canada's population. It will be noted that although the population in New Brunswick is growing, it declined relatively to that of Canada from 3.9 per cent to 3.0 per cent between 1946 and 1967. One means of distributing grants would be to use a per capita base, which means that New Brunswick in 1967 would have received 3.0 per cent of federal funds for education.

The age distribution of the population can indicate the fiscal needs of the province (it is one variable amongst many). Tables B-2 and B-3 demonstrate the age breakdown in absolute and proportional terms for New Brunswick and Canada. A careful examination of these tables shows that New Brunswick had a considerably smaller proportion of the population in the productive ages (25-64) than did Canada while at the same time it had a larger proportion of the population in the ages when schooling is usually demanded (5-24).

Of importance also is the geographical distribution of the population. The geographical distribution can be seen in Tables B-4 to B-6, and it will be noted there that the percentage of New Brunswick's population that could be classed as "urban" was considerably smaller than for the whole of Canada. Some counties were even more pronounced in their rural nature. The lack of "rural" population makes

TABLE B-2

POPULATION OF NEW BRUNSWICK BY AGE GROUPS FOR CENSUS YEARS,
CENSUS YEARS 1951-1966

| Age | 1951 | | 1956 | | 1961 | | 1966 | |
|---|---|---|---|---|---|---|---|---|
| | Thousands | % | Thousands | % | Thousands | % | Thousands | % |
| 0-4 | 74.9 | 14.5 | 74.3 | 13.4 | 78.6 | 13.1 | 72.9 | 11.8 |
| 5-14 | 109.0 | 21.1 | 131.0 | 23.6 | 148.6 | 24.9 | 149.2 | 24.2 |
| 15-19 | 42.9 | 8.3 | 47.0 | 8.5 | 53.5 | 9.0 | 65.6 | 10.6 |
| 20-24 | 36.6 | 7.1 | 36.4 | 6.6 | 37.4 | 6.3 | 42.3 | 6.9 |
| 25-34 | 72.2 | 14.0 | 69.3 | 12.5 | 67.5 | 11.3 | 65.2 | 10.6 |
| 35-44 | 61.6 | 11.9 | 66.5 | 12.0 | 69.8 | 11.7 | 66.7 | 10.8 |
| 45-54 | 44.1 | 8.6 | 49.6 | 8.9 | 56.7 | 9.5 | 60.6 | 9.8 |
| 55-64 | 35.5 | 6.9 | 37.3 | 6.7 | 38.9 | 6.5 | 44.0 | 7.1 |
| 65+ | 39.0 | 7.6 | 43.2 | 7.8 | 46.9 | 7.8 | 50.3 | 8.2 |
| Total | 515.7 | 100.0 | 554.5 | 100.0 | 597.9 | 100.0 | 616.8 | 100.0 |

Source: Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. I, Table 23; Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1956 (Ottawa: Queen's Printer), Bulletin 3-3, Table 1; Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Vol. I (2-2), Table 22; and Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1966 (Ottawa: Queen's Printer), Vol. I (1-10), Table 21.

TABLE B-3

POPULATION OF CANADA BY AGE GROUPS FOR CENSUS YEARS,
CENSUS YEARS 1951-1966

| Age | 1951 | | 1956 | | 1961 | | 1966 | |
|---|---|---|---|---|---|---|---|---|
| | Thousands | % | Thousands | % | Thousands | % | Thousands | % |
| 0-4 | 1,722.1 | 12.3 | 1,983.6 | 12.3 | 2,256.4 | 12.3 | 2,197.4 | 11.0 |
| 5-14 | 2,535.8 | 18.1 | 3,241.6 | 20.2 | 3,935.5 | 21.6 | 4,394.4 | 22.0 |
| 15-19 | 1,058.0 | 7.6 | 1,162.3 | 7.2 | 1,432.6 | 7.8 | 1,837.7 | 9.2 |
| 20-24 | 1,088.6 | 7.8 | 1,129.1 | 7.0 | 1,183.6 | 6.5 | 1,461.3 | 7.3 |
| 25-34 | 2,173.9 | 15.5 | 2,414.4 | 15.0 | 2,481.1 | 13.6 | 2,483.5 | 12.4 |
| 35-44 | 1,867.7 | 13.3 | 2,139.8 | 13.3 | 2,389.9 | 13.1 | 2,543.2 | 12.7 |
| 45-54 | 1,407.3 | 10.1 | 1,611.9 | 10.0 | 1,878.5 | 10.3 | 2,078.2 | 10.4 |
| 55-64 | 1,076.8 | 7.7 | 1,154.2 | 7.2 | 1,289.5 | 7.1 | 1,479.7 | 7.4 |
| 65+ | 1,086.3 | 7.8 | 1,243.9 | 7.7 | 1,391.2 | 7.6 | 1,539.5 | 7.7 |
| Total | 14,009.3 | 100.0 | 16,080.8 | 100.0 | 18,238.2 | 100.0 | 20,014.9 | 100.0 |

Source: Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. I, Table 23; Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1956 (Ottawa: Queen's Printer), Bulletin 3-3, Table 1; Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Vol. I (2-2), Table 22; and Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1966 (Ottawa: Queen's Printer), Vol. I (1-10), Table 21.

TABLE B-4

URBAN POPULATION: CANADA, NEW BRUNSWICK, NEW BRUNSWICK COUNTIES, CENSUS YEARS 1951-1966[a]

| Place | 1951 | 1956 | 1961 | 1966 |
|---|---|---|---|---|
| | Thousands of People | | | |
| Canada | 8,628.3 | 10,714.9 | 12,700.4 | 14,726.8 |
| New Brunswick | 215.0 | 254.3 | 278.0 | 312.2 |
| | Percentage of Population | | | |
| Canada | 61.4 | 66.9 | 69.6 | 73.6 |
| New Brunswick | 41.7 | 44.0 | 46.5 | 50.6 |
| Counties | | | | |
| Albert | . . | 14.7 | 31.4 | 39.3 |
| Carleton | 22.4 | 23.1 | 22.7 | 23.4 |
| Charlotte | 40.9 | 40.3 | 34.1 | 34.2 |
| Gloucester | 9.8 | 18.2 | 19.9 | 33.3 |
| Kent | 5.2 | 12.1 | 10.9 | 14.1 |
| Kings | 37.6 | 39.6 | 19.2 | 30.8 |
| Madawaska | 35.5 | 36.7 | 44.4 | 46.2 |
| Northumberland | 25.2 | 28.2 | 30.1 | 32.5 |
| Queens | . . | 9.3 | 11.7 | 24.1 |
| Restigouche | 45.3 | 45.5 | 51.4 | 52.5 |
| St. John | 98.1 | 98.0 | 88.1 | 86.7 |
| Sunbury | 18.6 | 14.7 | 59.2 | 61.3 |
| Victoria | 20.1 | 26.7 | 26.6 | 28.4 |
| Westmorland | 57.1 | 62.5 | 60.9 | 65.4 |
| York | 48.3 | 57.0 | 58.0 | 60.8 |

[a]The definition of "urban" used by the Census Division is "all persons residing in cities, towns, and villages of 1,000 and over as well as the population of all parts of census metropolitan areas."

Source: Calculated from Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. I, Table 15; Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1956 (Ottawa: Queen's Printer), Bulletin 1-7, Table 12; and Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1966 (Ottawa: Queen's Printer), Bulletin 1 (1-8), Table 13.

TABLE B-5

RURAL NON-FARM POPULATION: CANADA, NEW BRUNSWICK, NEW BRUNSWICK COUNTIES, CENSUS YEARS 1951-1966

| Place | 1951 | 1956 | 1961[a] | 1966 |
|---|---|---|---|---|
| | Thousands of People | | | |
| Canada | 2,553.4 | 2,734.3 | 3,465.1 | 3,374.4 |
| New Brunswick | 154.9 | 175.3 | 257.7 | 253.1 |
| | Percentage of Population | | | |
| Canada | 17.9 | 16.9 | 19.0 | 16.9 |
| New Brunswick | 28.1 | 31.6 | 43.1 | 41.0 |
| Counties | | | | |
| Albert | 71.8 | 62.9 | 58.0 | 53.4 |
| Carleton | 34.2 | 37.4 | 50.5 | 50.4 |
| Charlotte | 44.6 | 52.4 | 60.7 | 60.7 |
| Gloucester | 39.3 | 43.0 | 70.3 | 56.7 |
| Kent | 39.7 | 42.5 | 65.4 | 68.6 |
| Kings | 24.9 | 27.7 | 58.4 | 50.9 |
| Madawaska | 35.3 | 35.4 | 39.2 | 42.1 |
| Northumberland | 39.9 | 47.0 | 61.6 | 62.5 |
| Queens | 63.1 | 65.9 | 71.0 | 59.6 |
| Restigouche | 27.1 | 29.9 | 40.0 | 39.4 |
| St. John | 1.5 | 1.8 | 11.5 | 13.1 |
| Sunbury | 45.5 | 61.5 | 35.0 | 33.9 |
| Victoria | 41.6 | 38.2 | 52.7 | 54.2 |
| Westmorland | 22.8 | 22.4 | 31.2 | 28.9 |
| York | 26.7 | 23.3 | 31.5 | 31.7 |

[a]Some of the increase in numbers and percentages can be accounted for by a change in definition of farm population. See Table B-6.

Source: Calculated from Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. I, Table 15; Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1956 (Ottawa: Queen's Printer), Bulletin 1-7, Table 12; and Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1966 (Ottawa: Queen's Printer), Bulletin 1 (1-8), Table 13.

TABLE B-6

RURAL FARM POPULATION: CANADA, NEW BRUNSWICK, NEW BRUNSWICK COUNTIES, CENSUS YEARS 1951-1966[a]

| Place | 1951 | 1956 | 1961 | 1966 |
|---|---|---|---|---|
| | Thousands of People | | | |
| Canada | 2,827.7 | 2,631.6 | 2,072.8 | 1,913.7 |
| New Brunswick | 145.8 | 125.0 | 62.3 | 51.5 |
| | Percentage of Population | | | |
| Canada | 20.0 | 16.3 | 11.4 | 9.6 |
| New Brunswick | 28.3 | 22.5 | 10.4 | 8.4 |
| Counties | | | | |
| Albert | 28.2 | 22.3 | 10.6 | 7.4 |
| Carleton | 43.4 | 39.5 | 26.8 | 26.1 |
| Charlotte | 14.5 | 7.3 | 5.2 | 5.1 |
| Gloucester | 50.9 | 38.7 | 9.8 | 10.0 |
| Kent | 55.1 | 45.4 | 23.7 | 17.2 |
| Kings | 37.4 | 32.7 | 22.5 | 18.2 |
| Madawaska | 29.2 | 27.8 | 16.4 | 11.8 |
| Northumberland | 35.0 | 24.8 | 8.4 | 5.0 |
| Queens | 36.9 | 24.8 | 17.4 | 16.3 |
| Restigouche | 27.4 | 24.6 | 8.6 | 8.0 |
| St. John | 0.3 | . . | 0.4 | 0.3 |
| Sunbury | 35.9 | 23.8 | 5.8 | 4.7 |
| Victoria | 38.2 | 35.1 | 20.7 | 17.4 |
| Westmorland | 20.1 | 15.0 | 7.9 | 5.7 |
| York | 25.0 | 19.7 | 10.5 | 7.5 |

[a]Prior to 1961 rural farm population was defined as comprising "all persons living on a farm defined as a holding on which agricultural operations are carried out and which comprises: (i) 3 acres or more in size; (ii) 1 to 3 acres having agricultural products amounting to a market value of $250 or more in the previous year." In 1961, the definition of "farm" was changed to "a holding of one or more acres with sales of agricultural products of $50 or more."

Source: Calculated from Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1951 (Ottawa: Queen's Printer), Vol. I, Table 15; Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1956 (Ottawa: Queen's Printer), Bulletin 1-7, Table 12; and Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1966 (Ottawa: Queen's Printer), Bulletin 1 (1-8), Table 13.

the "rural non-farm population" table more meaningful. While in 1966 only 16.9 per cent of the population of Canada was so classified, 41.0 per cent of New Brunswick's population was in this category. No doubt some are professionals or urban workers with country estates; the majority would be rural or "hamlet" residents who derive their incomes locally through odd jobs, lumbering, small-town trades and retailing. Some possibly do farm but do not qualify as "farm population" by census definition because of insufficient sales of agricultural produce or insufficient land holdings. These are the very people who do not receive steady or large incomes.

There is a trend away from an agriculturally-dependent population towards greater "urbanization" and greater numbers of rural "non-farming" residents. However, this trend from rural to urban may or may not be the assistance required to upgrade incomes and economic growth.

Socially and economically the distribution of the population by language may have some effect. This material is presented in Table B-7. It will be noted that New Brunswick approximates Canada in language while the counties are varied in the predominance of one language or another.

No analysis of the population would be complete without an examination of the educational attainments of the population. Table B-8 sets out in cumulative percentages the educational attainments of the population of five years

TABLE B-7

LANGUAGE DISTRIBUTION, CANADA, NEW BRUNSWICK AND NEW BRUNSWICK COUNTIES, 1961
(Percentage of Population)

| Place | English Only | English and French | French Only | Neither |
|---|---|---|---|---|
| Canada | 67.4 | 12.2 | 19.1 | 1.3 |
| New Brunswick | 62.0 | 19.0 | 18.7 | 0.3 |
| Counties | | | | |
| Albert | 97.4 | 2.4 | 0.1 | . . |
| Carleton | 97.1 | 1.7 | 0.1 | . . |
| Charlotte | 95.9 | 3.8 | 0.3 | . . |
| Gloucester | 11.7 | 29.0 | 59.0 | 0.2 |
| Kent | 15.5 | 38.0 | 45.7 | 0.7 |
| Kings | 97.4 | 2.5 | 0.1 | 0.1 |
| Madawaska | 2.9 | 30.3 | 66.5 | 0.2 |
| Northumberland | 70.5 | 15.6 | 13.2 | 0.6 |
| Queens | 94.1 | 5.2 | 0.5 | 0.1 |
| Restigouche | 32.6 | 35.0 | 32.2 | 0.2 |
| St. John | 91.1 | 8.0 | 0.7 | 0.2 |
| Sunbury | 86.9 | 11.4 | 1.3 | 0.3 |
| Victoria | 58.9 | 23.4 | 17.5 | 0.2 |
| Westmorland | 55.9 | 32.9 | 10.9 | 0.3 |
| York | 95.5 | 4.0 | 0.4 | 0.1 |

Source: Calculated from Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Bulletin 1.2-9, Table 66.

TABLE B-8

EDUCATIONAL ATTAINMENT OF POPULATION FIVE YEARS AND OVER, CANADA, NEW BRUNSWICK AND NEW BRUNSWICK COUNTIES, 1961

| Place | Percentage of Population Five Years and Up Having at Least | | | | | | |
|---|---|---|---|---|---|---|---|
| | University | | Secondary School | | | Elementary School | |
| | Degree | Some | 5 years | 3 years | 1 year | 5 years | Kindergarten |
| Canada | 2.8 | 5.7 | 12.0 | 29.9 | 50.6 | 86.5 | 94.2 |
| New Brunswick | 1.7 | 4.3 | 6.8 | 22.3 | 40.3 | 80.9 | 91.1 |
| Counties | | | | | | | |
| Albert | 1.6 | 5.7 | 8.0 | 28.3 | 49.8 | 88.4 | 93.3 |
| Carleton | 1.0 | 4.1 | 7.8 | 23.5 | 42.0 | 87.4 | 93.1 |
| Charlotte | 1.4 | 4.1 | 6.2 | 22.4 | 41.4 | 90.3 | 94.7 |
| Gloucester | 1.1 | 2.4 | 4.0 | 10.8 | 21.3 | 62.3 | 84.6 |
| Kent | 0.5 | 1.4 | 2.3 | 7.2 | 16.7 | 65.8 | 87.1 |
| Kings | 2.2 | 5.7 | 7.2 | 26.8 | 46.4 | 88.5 | 94.0 |
| Madawaska | 1.5 | 3.9 | 10.4 | 19.6 | 32.5 | 69.3 | 86.6 |
| Northumberland | 0.8 | 3.1 | 5.4 | 19.6 | 37.3 | 78.3 | 90.2 |
| Queens | 0.6 | 2.9 | 7.5 | 18.6 | 40.0 | 83.8 | 93.3 |
| Restigouche | 1.2 | 3.1 | 4.3 | 16.5 | 30.9 | 70.6 | 85.7 |
| St. John | 2.0 | 5.0 | 7.4 | 29.8 | 53.2 | 89.2 | 94.2 |
| Sunbury | 1.1 | 3.2 | 6.5 | 19.5 | 44.9 | 83.8 | 91.1 |
| Victoria | 1.0 | 4.0 | 6.3 | 18.8 | 35.2 | 77.6 | 89.5 |
| Westmorland | 2.3 | 5.3 | 7.1 | 25.2 | 44.2 | 85.8 | 93.2 |
| York | 3.4 | 6.7 | 10.8 | 30.2 | 50.3 | 89.0 | 94.3 |

Source: Calculated from Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Bulletin 1.2-10, Table 74.

and over not presently (1961 census) attending school. This was done for Canada, New Brunswick, and each county in New Brunswick. It will be noted that 8.9 per cent of the New Brunswick population five years and over had had no schooling, and this is considerably greater than the 5.8 per cent of the Canadian population in this category. Some of the counties show evidence of up to 15.4 per cent of the population with no schooling.

In Table B-9, the figures for those attending school are set out. Here, a comparison with other provinces is also of interest. This will be found in Table B-10. The two tables show the school attenders as a percentage of the population five years and over and as a percentage of the school-age (5-24) population. As well, the school attenders are broken down by education level which gives some indication as to the relative fiscal requirements (given that the higher the level of education, the more costly it is to provide one child-year of education). It should be noted that the tables do not represent a proxy for drop-out rates for the population age groupings may vary. The tables also avoid any reference to the desired levels of school attendance.

An analysis of the population must include an analysis of the labour force. Participation rates are important. They can be an indicator of underemployment of human resources or an indication of the lack of opportunities.

TABLE B-9

SCHOOL ATTENDANCE, NEW BRUNSWICK AND NEW BRUNSWICK COUNTIES, 1961

| Place | Percentage of Population Five Years and Over Attending | | | | | Percentage of Population 5-24 Attending School |
|---|---|---|---|---|---|---|
| | School | Elementary | Secondary | Some University | Degree | |
| New Brunswick | 30.3 | 24.1 | 5.7 | 0.4 | 0.1 | 65.0 |
| | | | Counties | | | |
| Albert | 29.9 | 23.8 | 5.9 | 0.3 | . . | |
| Carleton | 30.0 | 23.1 | 6.4 | 0.5 | 0.1 | |
| Charlotte | 26.2 | 19.9 | 5.6 | 0.5 | 0.1 | |
| Gloucester | 35.0 | 30.1 | 4.6 | 0.3 | 0.1 | |
| Kent | 33.0 | 28.5 | 4.2 | 0.2 | . . | |
| Kings | 28.2 | 21.8 | 5.9 | 0.4 | 0.1 | |
| Madawaska | 36.2 | 28.5 | 6.9 | 0.6 | 0.1 | |
| Northumberland | 32.8 | 26.5 | 5.9 | 0.3 | 0.1 | |
| Queens | 29.8 | 19.9 | 9.3 | 0.4 | 0.1 | |
| Restigouche | 32.6 | 27.1 | 5.1 | 0.4 | 0.1 | |
| St. John | 25.5 | 19.8 | 5.1 | 0.4 | 0.1 | |
| Sunbury | 29.3 | 24.6 | 4.4 | 0.2 | . . | |
| Victoria | 33.9 | 26.2 | 7.1 | 0.5 | 0.1 | |
| Westmorland | 29.4 | 22.9 | 5.8 | 0.5 | 0.1 | |
| York | 27.2 | 19.9 | 6.3 | 0.7 | 0.3 | |

Source: Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Bulletin 1.2-10, Table 74.

TABLE B-10

SCHOOL ATTENDANCE, CANADA, PROVINCES, AND TERRITORIES, 1961

| Place | Percentage of Population Five Years and Over Attending | | | | | Percentage of Population 5-24 Attending School |
|---|---|---|---|---|---|---|
| | School | Elementary | Secondary | Some University | Degree | |
| Canada | 27.3 | 20.7 | 5.9 | 0.6 | 0.2 | 65.6 |
| **Provinces** | | | | | | |
| Newfoundland | 33.4 | 27.4 | 5.6 | 0.3 | 0.1 | 65.2 |
| P.E.I. | 28.7 | 22.4 | 5.8 | 0.5 | 0.1 | 65.4 |
| Nova Scotia | 29.5 | 23.6 | 5.2 | 0.5 | 0.2 | 67.5 |
| New Brunswick | 30.3 | 24.1 | 5.7 | 0.4 | 0.1 | 65.0 |
| Quebec | 27.5 | 20.6 | 6.1 | 0.6 | 0.2 | 61.3 |
| Ontario | 26.7 | 20.3 | 5.7 | 0.5 | 0.2 | 68.9 |
| Manitoba | 26.8 | 20.1 | 5.9 | 0.7 | 0.2 | 66.6 |
| Saskatchewan | 27.6 | 20.7 | 6.1 | 0.6 | 0.1 | 66.6 |
| Alberta | 27.7 | 20.9 | 6.0 | 0.6 | 0.2 | 65.6 |
| British Columbia | 25.5 | 18.5 | 6.1 | 0.8 | 0.2 | 67.9 |
| Yukon and N.W.T. | 22.3 | 19.4 | 2.5 | 0.3 | 0.1 | 49.2 |

Source: Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Bulletin 1.2-10, Introduction and Table 74; Bulletin 7.1-10, Table IV.

Since they are based on the population fifteen years of age and over, many who are in school or retired are included in the base, and normally a student would not be considered underemployed. It is possible, therefore, to observe that the participation rates, while measuring the employment of human resources, also measure other things.[1]

Table B-11 sets out the labour force participation rates for all provinces and Canada, both as a percentage of total population and as a percentage of the population fifteen years of age and over. In both ways, New Brunswick has lower rates than most other provinces (Newfoundland is notably lower than New Brunswick). As a percentage of the population fifteen years and over New Brunswick females had the highest participation rate in the Atlantic Provinces, but the percentage was lower than for other Canadian provinces.

Table B-12 divides the labour force into individual occupation categories. The differences are noticeable in that low-education (labourers, fishing and trapping, and logging) accounted for a significantly larger part of the male labour force in New Brunswick as compared with Canada while high-education occupations (managerial, professional, commercial, and financial) constituted a significantly

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[1]This is particularly true for New Brunswick, for in Table B-2 it was seen that New Brunswick had considerably fewer people (percentage-wise) in the 25-64 age group out of which the labour force is drawn than did Canada.

TABLE B-11

LABOUR FORCE PARTICIPATION RATES, CANADA AND PROVINCES, 1951 AND 1961

| Place | Labour Force[a] | | Labour Force as a Percentage of Total Population | | Labour Force as a Percentage of Population Fifteen Years and Over | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Males | | Females | |
| | 1951 | 1961 | 1951 | 1961 | 1951 | 1961 | 1951 | 1961 |
| Canada | 5,299.3 | 6,510.4 | 37.8 | 35.7 | 84.0 | 78.1 | 24.1 | 29.7 |
| Provinces | | | | | | | | |
| Newfoundland | 107.2 | 113.8 | 29.6 | 24.8 | 79.4 | 65.3 | 16.1 | 18.6 |
| Prince Edward Island | 34.2 | 34.3 | 34.7 | 32.8 | 84.3 | 76.5 | 18.7 | 24.9 |
| Nova Scotia | 221.9 | 238.8 | 34.5 | 32.4 | 81.9 | 74.0 | 20.0 | 24.8 |
| New Brunswick | 169.5 | 179.7 | 32.9 | 30.0 | 81.7 | 71.6 | 20.6 | 25.1 |
| Quebec | 1,472.6 | 1,781.7 | 36.3 | 33.9 | 85.2 | 77.3 | 25.1 | 28.2 |
| Ontario | 1,885.0 | 2,404.8 | 41.0 | 38.6 | 85.7 | 81.1 | 26.6 | 32.9 |
| Manitoba | 298.6 | 343.9 | 38.4 | 37.3 | 82.7 | 78.4 | 24.3 | 31.6 |
| Saskatchewan | 302.0 | 326.7 | 36.3 | 35.3 | 82.4 | 78.2 | 18.8 | 26.6 |
| Alberta | 353.9 | 491.5 | 37.7 | 36.9 | 84.1 | 80.9 | 20.5 | 31.0 |
| British Columbia | 444.6 | 581.4 | 38.2 | 35.7 | 78.4 | 74.5 | 23.4 | 28.6 |

[a]In thousands of people.

Source: Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Bulletin 7.1-12, Table 1.

TABLE B-12

LABOUR FORCE BY OCCUPATION, CANADA AND NEW BRUNSWICK, 1951 AND 1961

| Occupation | Percentage Distribution of Labour Force by Occupation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Male | | | | Female | | | |
| | 1951 | | 1961 | | 1951 | | 1961 | |
| | Canada | New Brunswick | Canada | New Brunswick | Canada | New Brunswick | Canada | New Brunswick |
| Proprietary and Managerial | 8.7 | 7.3 | 9.6 | 8.6 | 3.0 | 3.9 | 2.9 | 3.8 |
| Professional | 5.3 | 3.5 | 7.7 | 5.6 | 14.4 | 18.5 | 15.5 | 20.4 |
| Clerical | 5.9 | 4.6 | 6.7 | 5.5 | 27.5 | 21.7 | 28.6 | 24.3 |
| Agricultural | 19.3 | 19.4 | 12.2 | 9.2 | 2.8 | 1.2 | 4.3 | 0.8 |
| Fishing, Hunting, and Trapping | 1.3 | 3.4 | 0.8 | 2.8 | . . | . . | . . | . . |
| Logging | 2.5 | 10.8 | 1.7 | 6.8 | . . | . . | . . | . . |
| Mining & Quarrying | 1.6 | 0.7 | 1.4 | 0.8 | . . | . . | . . | . . |
| Manufacturing and Mechanical | 17.9 | 12.1 | 18.4 | 14.0 | 14.6 | 9.4 | 9.9 | 5.5 |
| Construction | 7.1 | 6.3 | 7.1 | 7.3 | 0.1 | . . | 0.1 | . . |
| Transportation | 9.2 | 11.6 | 9.8 | 11.6 | 2.9 | 2.5 | 2.2 | 2.6 |
| Commercial | 4.7 | 3.8 | 5.6 | 5.1 | 10.4 | 12.0 | 10.0 | 12.0 |
| Financial | 0.8 | 0.4 | 1.1 | 0.6 | 0.1 | 0.1 | 0.2 | 0.2 |
| Service | 6.6 | 5.0 | 8.5 | 10.4 | 21.2 | 27.4 | 22.6 | 27.6 |
| Personal | 3.3 | 2.4 | 4.2 | 3.2 | 21.0 | 27.3 | 22.1 | 26.8 |
| Labourers | 8.0 | 9.6 | 6.9 | 9.4 | 1.8 | 1.5 | 1.2 | 0.7 |
| Not Stated | 1.3 | 1.5 | 2.7 | 2.3 | 1.1 | 1.7 | 2.5 | 2.0 |

Source: Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Bulletin 3.1-1, Table 3.

smaller part of the New Brunswick male labour force as compared with Canada.

When the female labour force distribution is examined, there at first appears to be no connection between educational background and occupational distribution. In fact, the two occupational groupings which attract a significantly larger percentage of women in New Brunswick than in Canada (professional and service) are ones where women experience few barriers to entry--i.e., teaching, nursing, and housework, etc. It would appear, then, that the low percentage in some other occupations as compared with Canada may be the result of lack of jobs rather than any real lack of desire for participation.

If one were to extend this analysis back to the male labour force, it may not be that low levels of education lead to greater numbers of men in certain occupations and lower in others; it may be the opposite--that fewer jobs available in high-education occupations lead to a smaller demand for education. Then the question becomes one of which is the causal factor--a question which cannot be answered from statistics alone.

## 2. Resources

The purpose of this section is to demonstrate the development of New Brunswick's resources. Since the development of the staple thesis by Innis, there has been an

awareness amongst Canadian economists of the importance of the natural resources in the development of an economy.

In Table B-13, the value of production in primary industries for selected years is set out. Here it is noted that New Brunswick became increasingly less dependent on its primary industries. In 1967, only 30 per cent of commodity production was of a primary nature (compared with 45 per cent in 1945). The two industries which had the greatest relative decrease in the percentage of production value were agriculture and forestry (the value of agriculture in current dollars was down as well). The industry which increased its percentage of production value (electric power) is closely allied with secondary industry and service industry--both of which became more important in terms of value of output.

Table B-14 gives the reader an impression of the relative importance of various industries in providing employment in selected years. Trade has gained an importance as an employer (relative to 1949) while transportation has decreased in importance as an employer. Comparable figures for Canada show a similar trend for trade but not for transportation. The only industry in New Brunswick in 1965 that was more important as an employer than in 1949 for which there was not a similar trend for Canada was forestry. When examining Table B-14, there is a danger that the figures may be interpreted as the relative importance of

TABLE B-13

NET VALUE OF PRODUCTION BY INDUSTRY, NEW BRUNSWICK COMMODITY-PRODUCING PRIMARY INDUSTRIES, SELECTED YEARS, 1945-1967

| Industry | 1945 | | 1950 | | 1955 | | 1960 | | 1965 | | 1966 | | 1967 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Value[a] | %[b] | Value[a] | %[b] | Value[a] | %[b] | Value[a] | %[b] | Value[a] | %[b] | Value[a] | %[b] | Value[a] | %[b] |
| Agriculture | $29.2 | 20.3 | $32.3 | 13.2 | $28.5 | 9.8 | $35.8 | 10.4 | $40.5 | 9.2 | $37.6 | 7.9 | $27.2 | 5.8 |
| Forestry | 20.5 | 14.2 | 27.8 | 11.4 | 32.4 | 11.1 | 34.9 | 10.1 | 27.8 | 6.3 | 36.1 | 7.6 | 36.5 | 7.7 |
| Fisheries | 5.5 | 3.8 | 6.8 | 2.8 | 6.8 | 2.3 | 9.4 | 2.7 | 10.7 | 2.4 | 11.2 | 2.4 | 10.9 | 2.3 |
| Trapping | 0.4 | 0.3 | 0.3 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.3 | 0.1 | 0.3 | 0.1 | 0.3 | 0.1 |
| Mining | 3.3 | 2.3 | 10.9 | 4.4 | 10.4 | 3.5 | 7.9 | 2.3 | 36.5 | 8.3 | 31.5 | 6.7 | 32.6 | 6.9 |
| Electric Power | 4.9 | 3.4 | 7.0 | 2.9 | 12.0 | 4.1 | 18.7 | 5.4 | 29.5 | 6.7 | 32.0 | 6.8 | 35.0 | 7.4 |

[a]Expressed in millions of dollars.

[b]Expressed as a percentage of total production of all commodities in New Brunswick.

Source: Canada, Department of Energy, Mines and Resources, Mineral Resources Division, Mineral Resource Development: Province of New Brunswick (Ottawa: Queen's Printer, 1967), pp. 270-71, and Canada, Dominion Bureau of Statistics, Survey of Production, 1968 (Ottawa: Queen's Printer, 1970), p. 14.

TABLE B-14

INDEX OF EMPLOYMENT BY INDUSTRIES, NEW BRUNSWICK AND CANADA, SELECTED YEARS, 1947-1965
(1949 = 100)

| Industry | 1947 | | 1950 | | 1955 | | 1960 | | 1965 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N.B. | Canada | N.B. | Canada | N.B. | Canada | N.B. | Canada | N.B. | Canada |
| Mining | a | 88.6 | a | 106.0 | a | 113.7 | a | 120.1 | a | 123.6 |
| Forestry | 192.4 | 149.6 | 142.8 | 104.8 | 147.7 | 102.9 | 132.2 | 84.0 | 120.4 | 73.8 |
| Manufacturing | 102.8 | 97.2 | 99.3 | 101.4 | 95.3 | 109.8 | 96.5 | 109.5 | 111.5 | 128.3 |
| Construction | 93.3 | 85.6 | 98.2 | 103.1 | 94.5 | 115.0 | 85.9 | 125.7 | 95.9 | 142.4 |
| Transportation | 101.2 | 95.4 | 97.7 | 100.2 | 99.6 | 110.8 | 92.6 | 111.1 | 88.1 | 114.6 |
| Trade | 92.6 | 90.2 | 102.0 | 103.6 | 113.1 | 118.7 | 132.8 | 136.7 | 155.4 | 163.2 |
| Industrial Composite | 104.3 | 95.7 | 102.6 | 102.1 | 103.5 | 112.9 | 103.4 | 118.7 | 115.6 | 138.1 |

[a]Not available.

Source: Canada, Department of Energy, Mines and Resources, Mineral Resources Division, Mineral Resource Development: Province of New Brunswick (Ottawa: Queen's Printer, 1967), pp. 277-78.

various industries. Technological change allows for a change in the capital-labour ratio and an increase in total production. Thus, while the index of a particular industry as an employer decreases there may be an increase in production value.

Tables B-15, B-16 and Figures B-1 and B-2 show data for the mineral industry. In Table B-15, it is evident that mineral production became much more significant in the decade of the 1960's. This was particularly true for lead and zinc. In Table B-16, the per capita value of mineral production in the province shows the increasing output of the industry. Figure B-2 shows the relative importance of various types of minerals.

From these two tables and the figures, it becomes evident that New Brunswick has increased its mineral output, but its resources do not match those of, say, Ontario, Alberta, or British Columbia.

### 3. Income

Income statistics are intended to measure the economic welfare of a system in terms of income produced. The data most readily available for these purposes are subject to ambiguities. It is hoped that an examination here of some of these measures will indicate at least the directions of economic well-being.

TABLE B-15

MINERAL PRODUCTION, NEW BRUNSWICK, TEN MOST SIGNIFICANT MINERALS, 1946-1966
(In Millions of Dollars)

| Year | Copper | Lead | Silver | Zinc | Cement | Clay Products | Peat Moss | Sand and Gravel | Stone | Coal | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1946 | . . | . . | . . | . . | . . | 0.3 | 0.1 | 0.8 | 0.4 | 2.1 | 3.7 |
| 1947 | . . | . . | . . | . . | . . | 0.4 | 0.1 | 1.3 | 0.4 | 2.3 | 4.5 |
| 1948 | . . | . . | . . | . . | . . | 0.4 | 0.1 | 1.2 | 0.4 | 3.7 | 5.8 |
| 1949 | . . | . . | . . | . . | . . | 0.5 | 0.2 | 1.1 | 0.5 | 3.9 | 6.2 |
| 1950 | . . | . . | . . | . . | . . | 0.7 | 0.2 | 3.0 | 3.5 | 4.4 | 11.8 |
| 1951 | . . | . . | . . | . . | . . | 0.7 | 0.2 | 2.2 | 0.7 | 4.8 | 8.6 |
| 1952 | . . | . . | . . | . . | 1.5 | 0.7 | 0.1 | 1.8 | 0.5 | 5.8 | 10.4 |
| 1953 | . . | . . | . . | . . | 2.1 | 0.6 | 0.2 | 1.3 | 0.7 | 5.8 | 10.7 |
| 1954 | . . | . . | . . | . . | 2.2 | 0.6 | 0.2 | 1.8 | 0.6 | 6.2 | 11.6 |
| 1955 | a | 0.2 | a | . . | 2.3 | 0.7 | 0.2 | 2.9 | 1.3 | 7.1 | 14.7 |
| 1956 | a | 0.1 | a | 0.2 | 2.4 | 1.0 | 0.5 | 3.2 | 2.0 | 8.0 | 17.4 |
| 1957 | 3.3 | 0.3 | 0.3 | 0.8 | 2.6 | 0.8 | 0.8 | 3.7 | 1.5 | 8.2 | 22.3 |
| 1958 | 0.2 | a | a | 0.7 | 2.9 | 0.6 | 0.7 | 1.8 | 1.9 | 6.6 | 15.4 |
| 1959 | . . | . . | . . | . . | 2.6 | 0.7 | 0.8 | 2.9 | 2.0 | 8.3 | 17.3 |
| 1960 | . . | . . | . . | . . | 2.5 | 0.7 | 0.8 | 2.1 | 1.4 | 8.7 | 16.2 |
| 1961 | . . | . . | . . | . . | 2.8 | 0.7 | 1.2 | 2.8 | 3.2 | 7.5 | 18.2 |
| 1962 | 2.3 | 0.4 | 0.2 | 0.6 | 2.8 | 0.8 | 1.4 | 2.8 | 3.1 | 6.8 | 21.2 |
| 1963 | 5.6 | 0.4 | 0.5 | 2.7 | 2.7 | 0.6 | 1.1 | 2.7 | 4.1 | 7.2 | 27.6 |
| 1964 | 6.2 | 5.8 | 2.1 | 15.4 | 2.9 | 0.7 | 0.9 | 2.6 | 3.0 | 8.4 | 48.0 |
| 1965 | 7.6 | 13.5 | 3.8 | 37.3 | 2.9 | 0.7 | 1.5 | 2.6 | 2.9 | 8.6 | 81.4 |
| 1966[b] | 5.9 | 14.3 | 4.2 | 44.2 | 4.3 | 0.6 | 1.4 | 3.1 | 2.9 | 7.8 | 88.7 |

[a]Production of less than $50 thousand in value.

[b]Preliminary data.

Source: Canada, Department of Energy, Mines and Resources, Mineral Resources Division, Mineral Resource Development: Province of New Brunswick (Ottawa: Queen's Printer, 1967), pp. 267-69.

TABLE B-16

PER CAPITA VALUE OF MINERAL PRODUCTION,
PROVINCE OF NEW BRUNSWICK,
1946-1966

| Year | Value |
|---|---|
| 1946 | $ 10.07 |
| 1947 | 11.91 |
| 1948 | 14.06 |
| 1949 | 14.04 |
| 1950 | 24.92 |
| 1951 | 18.54 |
| 1952 | 21.48 |
| 1953 | 21.88 |
| 1954 | 23.09 |
| 1955 | 28.81 |
| 1956 | 32.90 |
| 1957 | 41.14 |
| 1958 | 28.50 |
| 1959 | 31.16 |
| 1960 | 28.99 |
| 1961 | 31.45 |
| 1962 | 35.93 |
| 1963 | 46.16 |
| 1964 | 78.89 |
| 1965 | 131.88 |
| 1966 | 142.54 |

Source: Canada, Department of Energy, Mines and Resources, Mineral Resources Division, Mineral Resource Development: Province of New Brunswick (Ottawa: Queen's Printer, 1967), p. 265.

VALUE OF MINERALS, NEW BRUNSWICK, 1945-1967

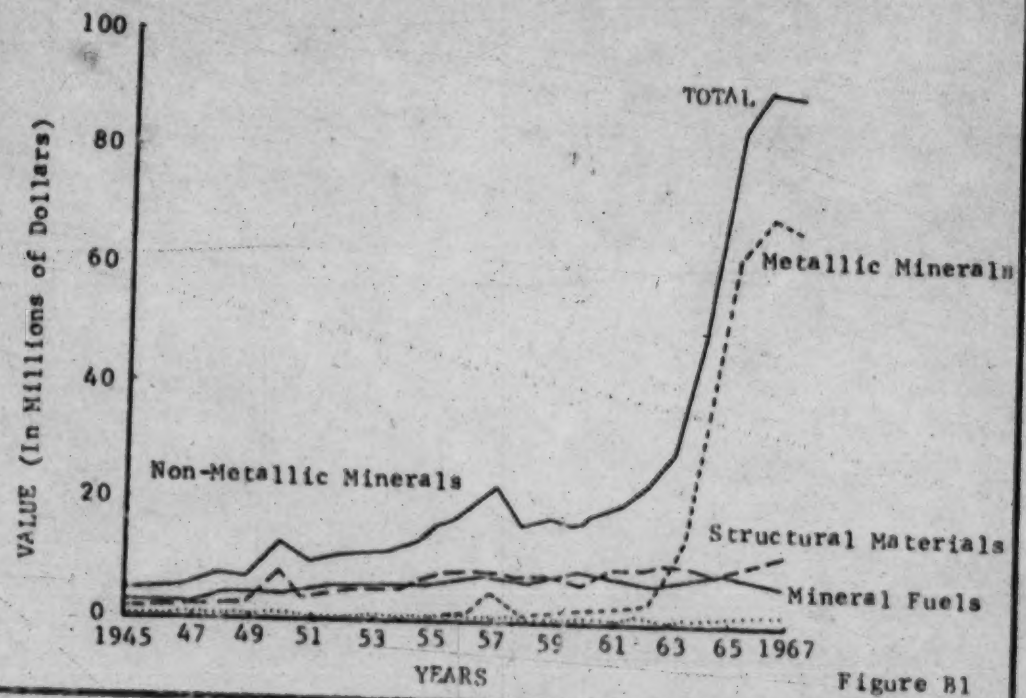


Figure B1

RELATIVE IMPORTANCE OF MINERALS, NEW BRUNSWICK, 1945-1967

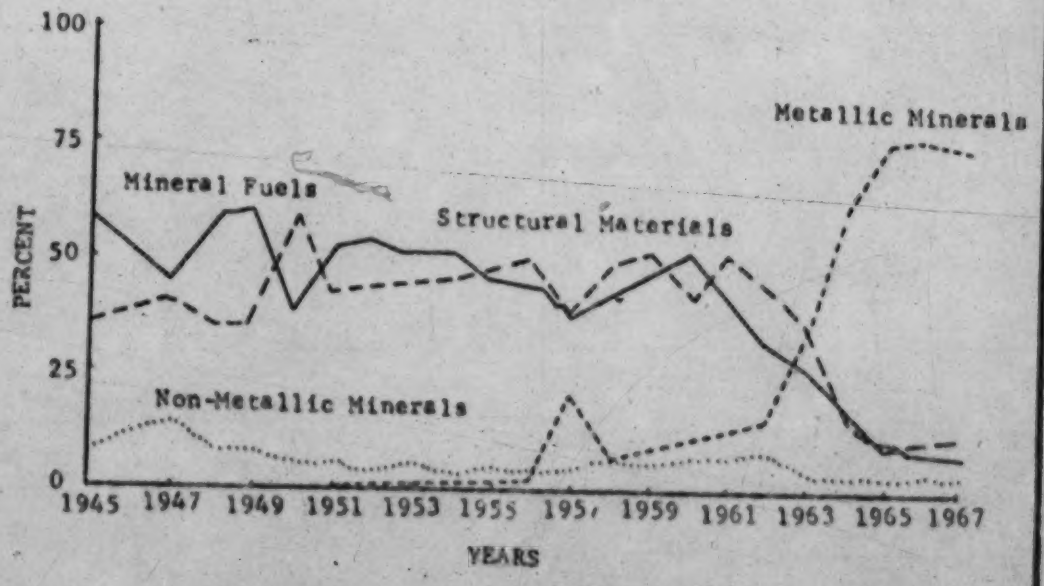


Figure B2

i) Average Income

The Census of Canada develops a series of statistics showing average incomes for the non-farm population aged fifteen and over. These statistics are meaningless for interprovincial comparisons if the occupational or age distribution is distorted between provinces. As well, although income is defined so as to include earnings from work, investment returns and transfer payments, it is unlikely that the respondents would reply with the same degree of accuracy.

In the 1961 Census of Canada, a 20 per cent sample of the population was surveyed for a number of variables. Non-farm incomes were calculated from the data collected in the sample. Table B-17 shows the available information.

The data in Table B-17 do not represent true average incomes for farm incomes are excluded and in calculating the averages, those people showing no income have been eliminated. Thus, a better measure of economic well-being is desirable.

ii) Personal Income

Another measure of well-being which is available on a regular basis is a series of personal income statistics. Personal income is the total income received by the household sector, including not only income originating from economic activity but also transfer payments. In 1966, the

## TABLE B-17

AVERAGE INCOMES FOR THE NON-FARM POPULATION AGED FIFTEEN YEARS AND OVER, CANADA, PROVINCES, AND NEW BRUNSWICK COUNTIES, 1961

| Place | Dollars | | | Index, Canada = 100 | | |
|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female |
| Canada | 3,130 | 3,999 | 1,651 | 100.0 | 100.0 | 100.0 |
| **Provinces** | | | | | | |
| Newfoundland | 2,227 | 2,665 | 1,133 | 71.1 | 66.6 | 68.6 |
| Prince Edward Island | 2,187 | 2,867 | 1,061 | 69.8 | 71.7 | 64.3 |
| Nova Scotia | 2,497 | 3,188 | 1,243 | 79.8 | 79.7 | 75.3 |
| New Brunswick | 2,435 | 3,070 | 1,255 | 77.8 | 76.8 | 76.0 |
| Quebec | 3,123 | 3,870 | 1,703 | 99.7 | 96.8 | 103.2 |
| Ontario | 3,331 | 4,335 | 1,747 | 106.4 | 108.4 | 105.8 |
| Manitoba | 2,960 | 3,884 | 1,521 | 94.5 | 97.1 | 92.1 |
| Saskatchewan | 2,789 | 3,608 | 1,454 | 89.1 | 90.2 | 88.1 |
| Alberta | 3,226 | 4,160 | 1,664 | 103.0 | 104.0 | 100.8 |
| British Columbia | 3,218 | 4,177 | 1,652 | 102.8 | 104.5 | 100.1 |
| **Counties** | | | | | | |
| Albert | a | 3,545 | 1,164 | a | 88.6 | 70.5 |
| Carleton | a | 2,370 | 1,028 | a | 59.3 | 62.3 |
| Charlotte | a | 3,143 | 1,100 | a | 78.6 | 66.6 |
| Gloucester | a | 2,425 | 935 | a | 60.6 | 56.6 |
| Kent | a | 1,853 | 747 | a | 46.3 | 45.2 |
| Kings | a | 3,315 | 1,239 | a | 82.9 | 75.0 |
| Madawaska | a | 2,947 | 1,156 | a | 73.7 | 70.0 |
| Northumberland | a | 2,398 | 1,096 | a | 60.0 | 66.4 |
| Queens | a | 2,558 | 911 | a | 64.0 | 55.2 |
| Restigouche | a | 2,947 | 1,140 | a | 73.7 | 69.0 |
| St. John | a | 3,604 | 1,522 | a | 90.1 | 92.2 |
| Sunbury | a | 3,468 | 1,176 | a | 86.7 | 71.2 |
| Victoria | a | 2,579 | 1,081 | a | 64.5 | 65.5 |
| Westmorland | a | 3,433 | 1,339 | a | 85.8 | 81.1 |
| York | a | 3,373 | 1,425 | a | 84.3 | 86.3 |

[a]Not available.

Source: Canada, Dominion Bureau of Statistics, Census Division, Census of Canada, 1961 (Ottawa: Queen's Printer), Bulletin 4.1-1, Tables A1 and A2.

latter accounted for 18 per cent of New Brunswick's personal income and only 10 per cent of Ontario's.[2] Undistributed corporation profits are not included in personal income. Personal income is thus directly measurable and differs from average income in that social insurance contributions are deducted and farm incomes are included.

Table B-18 shows the per capita personal income data for both New Brunswick and Canada on an annual basis for the years 1946 to 1967. It is noted that New Brunswick's relative position did not improve in the twenty-two years under review. In 1946, New Brunswick had a per capita personal income which was 24.8 per cent less than Canada's. By 1967, New Brunswick's personal income had fallen to 28.2 per cent behind Canada's although it had increased in dollar terms.

While personal income data are one measure of economic well-being, they do not represent a measure of economic activity. For this reason, attention is now turned to measures of net and gross income.

iii) Net and Gross Product

Tables B-19 and B-20 show per capita provincial and national products on a net and gross basis respectively.[3]

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[2] T. N. Brewis, Regional Economic Policies in Canada (Toronto: Macmillan Company of Canada Limited, 1969).

[3] For a complete description of these concepts, see Gardner Ackley, Macroeconomic Theory (New York: Macmillan Company, 1961), pp. 28-32.

TABLE B-18

PERSONAL INCOME PER CAPITA, NEW BRUNSWICK AND CANADA, 1946-1967[a]

| Year | New Brunswick | Canada | New Brunswick as a Percentage of Canada |
|---|---|---|---|
| 1946 | $ 594 | $ 791 | 75.1 |
| 1947 | 596 | 827 | 72.1 |
| 1948 | 637 | 928 | 68.6 |
| 1949 | 646 | 940 | 68.7 |
| 1950 | 680 | 979 | 69.5 |
| 1951 | 742 | 1,130 | 65.7 |
| 1952 | 772 | 1,203 | 64.2 |
| 1953 | 777 | 1,235 | 62.9 |
| 1954 | 806 | 1,205 | 66.9 |
| 1955 | 823 | 1,257 | 65.5 |
| 1956 | 895 | 1,361 | 65.8 |
| 1957 | 913 | 1,388 | 65.8 |
| 1958 | 947 | 1,445 | 65.5 |
| 1959 | 985 | 1,489 | 66.2 |
| 1960 | 1,048 | 1,534 | 68.3 |
| 1961 | 1,064 | 1,564 | 68.0 |
| 1962 | 1,114 | 1,667 | 66.8 |
| 1963 | 1,163 | 1,740 | 66.8 |
| 1964 | 1,272 | 1,822 | 69.8 |
| 1965 | 1,423 | 1,988 | 71.6 |
| 1966 | 1,533 | 2,152 | 71.2 |
| 1967 | 1,661 | 2,313 | 71.8 |

[a]Revised data for Canada are available in Canada, Dominion Bureau of Statistics, System of National Accounts: National Income and Expenditure Accounts, 1926-1968 (Ottawa: Queen's Printer, 1969), but the corresponding revision for New Brunswick is not available. Thus, the old series is used here.

Source: Canada, Dominion Bureau of Statistics, National Accounts: Income and Expenditure (Ottawa: Queen's Printer, various years, 1946-67), Table 29.

TABLE B-19

PER CAPITA NET INCOME AT FACTOR COST,
NEW BRUNSWICK AND CANADA, 1946-1967

| Year | New Brunswick | | | Canada | | | New Brunswick as a Percentage of Canada |
|---|---|---|---|---|---|---|---|
| | Net Income at Factor Cost[a] | Population[b] | Per Capita Net Income at Factor Cost (1)÷(2)=(3) | Net Income at Factor Cost[c] | Population[b] | Per Capita Net Income at Factor Cost (4)÷(5)=(6) | $\frac{(3)}{(6)} \times 100$ |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1946 | 262 | 478 | 548 | 9,551 | 12,292 | 777 | 70.5 |
| 1947 | 274 | 488 | 562 | 10,361 | 12,551 | 826 | 68.1 |
| 1948 | 307 | 498 | 617 | 12,003 | 12,823 | 936 | 65.9 |
| 1949 | 320 | 508 | 630 | 12,905 | 13,447 | 960 | 65.7 |
| 1950 | 347 | 512 | 678 | 14,161 | 13,712 | 1,033 | 65.7 |
| 1951 | 380 | 516 | 736 | 16,588 | 14,009 | 1,184 | 62.2 |
| 1952 | 401 | 526 | 762 | 18,654 | 14,459 | 1,290 | 59.1 |
| 1953 | 404 | 533 | 758 | 19,294 | 14,845 | 1,300 | 58.4 |
| 1954 | 421 | 540 | 780 | 19,032 | 15,287 | 1,245 | 62.7 |
| 1955 | 440 | 547 | 804 | 20,737 | 15,698 | 1,321 | 60.9 |
| 1956 | 489 | 555 | 881 | 23,654 | 16,081 | 1,440 | 61.2 |
| 1957 | 489 | 562 | 870 | 24,011 | 16,610 | 1,446 | 60.2 |
| 1958 | 501 | 571 | 877 | 24,944 | 17,080 | 1,460 | 60.1 |
| 1959 | 535 | 582 | 919 | 26,676 | 17,483 | 1,526 | 60.3 |
| 1960 | 562 | 589 | 954 | 27,375 | 17,870 | 1,532 | 62.3 |
| 1961 | 568 | 598 | 950 | 28,250 | 18,238 | 1,549 | 61.4 |
| 1962 | 605 | 605 | 1,000 | 30,653 | 18,583 | 1,650 | 60.7 |
| 1963 | 641 | 609 | 1,053 | 32,869 | 18,931 | 1,736 | 60.7 |
| 1964 | 709 | 611 | 1,160 | 35,397 | 19,290 | 1,835 | 63.3 |
| 1965 | 797 | 615 | 1,296 | 38,919 | 19,644 | 1,981 | 65.4 |
| 1966 | 866 | 617 | 1,404 | 43,306 | 20,015 | 2,164 | 64.9 |
| 1967 | 926 | 619 | 1,496 | 46,298 | 20,405 | 2,269 | 66.0 |

[a]Table B-21, column (6). In millions of dollars.

[b]Table B-1. In thousands of people.

[c]Canada, Dominion Bureau of Statistics, National Accounts Division, National Accounts: Income and Expenditure (Ottawa: Queen's Printer, various years, 1958-67), and Canada, Dominion Bureau of Statistics, Research Division, National Accounts: Income and Expenditure, 1926-1956 (Ottawa: Queen's Printer, 1958). In millions of dollars.

TABLE B-20

PER CAPITA GROSS NATIONAL (PROVINCIAL) PRODUCT AT MARKET PRICES, NEW BRUNSWICK AND CANADA, 1946-1967

| Year | New Brunswick | | | Canada | | | |
|---|---|---|---|---|---|---|---|
| | Gross Provincial Product at Market Prices[a] (1) | Population[b] (2) | Per Capita Gross Provincial Product (3) | Gross National Product at Market Prices[c] (4) | Population[b] (5) | Per Capita Gross National Product (6) | New Brunswick as a Percentage of Canada (7) |
| 1946 | 321 | 478 | 672 | 11,850 | 12,292 | 964 | 69.7 |
| 1947 | 346 | 488 | 709 | 13,165 | 12,551 | 1,049 | 67.6 |
| 1948 | 387 | 498 | 777 | 15,120 | 12,823 | 1,179 | 65.9 |
| 1949 | 405 | 508 | 797 | 16,343 | 13,447 | 1,215 | 65.6 |
| 1950 | 441 | 512 | 861 | 18,006 | 13,712 | 1,313 | 65.6 |
| 1951 | 489 | 516 | 948 | 21,170 | 14,009 | 1,511 | 62.8 |
| 1952 | 513 | 526 | 975 | 23,995 | 14,459 | 1,660 | 58.8 |
| 1953 | 526 | 533 | 987 | 25,020 | 14,845 | 1,686 | 58.6 |
| 1954 | 558 | 540 | 1,033 | 24,871 | 15,287 | 1,627 | 63.5 |
| 1955 | 587 | 547 | 1,073 | 27,132 | 15,698 | 1,728 | 62.1 |
| 1956 | 653 | 555 | 1,177 | 30,585 | 16,081 | 1,902 | 61.9 |
| 1957 | 667 | 562 | 1,187 | 31,909 | 16,610 | 1,921 | 61.8 |
| 1958 | 674 | 571 | 1,180 | 32,867 | 17,080 | 1,924 | 61.4 |
| 1959 | 728 | 582 | 1,251 | 34,857 | 17,483 | 1,994 | 62.8 |
| 1960 | 768 | 589 | 1,304 | 35,959 | 17,870 | 2,012 | 64.8 |
| 1961 | 780 | 598 | 1,304 | 37,471 | 18,238 | 2,055 | 63.5 |
| 1962 | 830 | 605 | 1,372 | 40,575 | 18,583 | 2,184 | 62.9 |
| 1963 | 879 | 609 | 1,443 | 43,424 | 18,931 | 2,294 | 63.0 |
| 1964 | 973 | 611 | 1,593 | 47,393 | 19,290 | 2,457 | 64.9 |
| 1965 | 1,091 | 615 | 1,774 | 52,203 | 19,644 | 2,658 | 66.8 |
| 1966 | 1,186 | 617 | 1,922 | 58,120 | 20,015 | 2,904 | 66.2 |
| 1967 | 1,265 | 619 | 2,044 | 62,068 | 20,405 | 3,042 | 67.2 |

[a]Table B-21, column (9). In millions of dollars.

[b]Table B-1. In thousands of people.

[c]Canada, Dominion Bureau of Statistics, National Accounts Division, National Accounts: Income and Expenditure (Ottawa: Queen's Printer, various years, 1958-67), and Canada, Dominion Bureau of Statistics, Research Division, National Accounts: Income and Expenditure, 1926-1956 (Ottawa: Queen's Printer, 1958). In millions of dollars.

The difference between the two is depreciation.[4] Thus, net product is "the output of consumer and government goods, plus the net increase in [the] stock of capital goods--new production of capital goods in excess of replacement"[5] while gross product is "the output of 'true' final goods, plus the production of new capital goods."[6]

For New Brunswick, the calculations of net provincial income and gross provincial product are found in Table B-21.[7] Since these figures are the only ones available, they are the ones that have been used to calculate the per capita data in Tables B-19 and B-20.

An examination of Table B-19 shows that New Brunswick's gross provincial product at market prices on a per capita basis rose by 204 per cent between 1946 and 1967 while Canada's rose by 216 per cent over the same time period. Again, as for per capita personal income, New Brunswick

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[4]The deduction of an allowance for using up machine services avoids double counting of final output and capital goods. Over a period of time, the net product adds up to the sum of final output but takes into account the volatility of investment activity and thus more accurately measures year-to-year fluctuations of productive activity.

[5]Ackley, Macroeconomic Theory, p. 31.

[6]Ibid.

[7]For the reasoning behind Table B-21, see D. B. Das Gupta, An Approach to a Social Accounting System for the Atlantic Provinces, Research Paper No. 4 (Fredericton, N.B.: Research Centre, Atlantic Provinces Economic Council, 1966), pp. 22-26.

TABLE B-21

GROSS PROVINCIAL PRODUCT AT MARKET PRICES, NEW BRUNSWICK, 1945-1967[a]
(In Millions of Dollars)

| Year | Personal Income | Earnings Not Paid Out to Persons, Canada x d | Interest on Public Debt in Canada x d | Transfer Payments, Province | Net Provincial Income at Factor Cost | Depreciation, etc., Canada x i | Gross Provincial Income at Factor Cost | Gross Provincial Product at Market Prices (Col. 8 x k) |
|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1945 | $ 250 | $ 37 | $-12 | $ -21 | $254 | $ 23 | $ 277 | $ 298 |
| 1946 | 284 | 36 | -13 | -45 | 262 | 24 | 286 | 321 |
| 1947 | 291 | 29 | -12 | -34 | 274 | 29 | 303 | 345 |
| 1948 | 317 | 37 | -13 | -34 | 307 | 34 | 341 | 387 |
| 1949 | 328 | 41 | -13 | -36 | 320 | 39 | 359 | 405 |
| 1950 | 348 | 49 | -12 | -38 | 347 | 44 | 391 | 441 |
| 1951 | 383 | 48 | -11 | -40 | 380 | 52 | 432 | 489 |
| 1952 | 406 | 56 | -10 | -51 | 401 | 57 | 458 | 513 |
| 1953 | 414 | 54 | -11 | -53 | 404 | 64 | 468 | 526 |
| 1954 | 435 | 59 | -13 | -59 | 421 | 71 | 492 | 558 |
| 1955 | 450 | 61 | -12 | -59 | 440 | 79 | 519 | 587 |
| 1956 | 497 | 67 | -13 | -62 | 489 | 90 | 579 | 653 |
| 1957 | 513 | 66 | -13 | -77 | 489 | 98 | 587 | 667 |
| 1958 | 541 | 66 | -14 | -92 | 501 | 98 | 599 | 674 |
| 1959 | 573 | 74 | -17 | -95 | 535 | 106 | 641 | 728 |
| 1960 | 617 | 72 | -19 | -108 | 562 | 113 | 675 | 768 |
| 1961 | 636 | 70 | -19 | -119 | 568 | 116 | 684 | 780 |
| 1962 | 674 | 77 | -21 | -125 | 605 | 125 | 730 | 830 |
| 1963 | 708 | 84 | -23 | -128 | 641 | 133 | 774 | 879 |
| 1964 | 777 | 98 | -25 | -141 | 709 | 142 | 851 | 973 |
| 1965 | 875 | 97 | -26 | -149 | 797 | 152 | 949 | 1,091 |
| 1966 | 946 | 111 | -28 | -163 | 866 | 166 | 1,032 | 1,186 |
| 1967 | 1,028 | 113 | -31 | -184 | 926 | 177 | 1,103 | 1,265 |

[a]The methodology and some of the data in this table were taken from D. B. Das Gupta, An Approach to a Social Accounting System for the Atlantic Provinces, Research Paper No. 4 (Fredericton, N.B.: Research Centre, Atlantic Provinces Economic Council, 1966). Data for other years were taken directly from Canada, Dominion Bureau of Statistics, National Accounts: Income and Expenditure (Ottawa: Queen's Printer, various years, 1945-67), and in all years the last three columns were recalculated from revised data found in Canada, Dominion Bureau of Statistics, System of National Accounts: National Income and Expenditure Accounts, 1926-1968 (Ottawa: Queen's Printer, 1969). Unfortunately the latter does not include revised personal income data provincially. For Canada, the revised data are higher than the old data.

Notes:

$d = \frac{\text{Interest, Dividends, etc., Province}}{\text{Interest, Dividends, etc., Canada}}$

$i = \frac{\text{Investment, 1948-1958, Province}}{\text{Investment, 1948-1958, Canada}}$

$k = \frac{\text{Gross National Product at Market Price}}{\text{Gross National Product at Factor Cost}}$

did not maintain its position with respect to Canada. If the percentage increase in gross product is considered (not on a per capita basis) the increase for New Brunswick was 294 per cent while for Canada it was 424 per cent. This aggregate growth comparison makes the disparity between New Brunswick and Canada seem even greater.

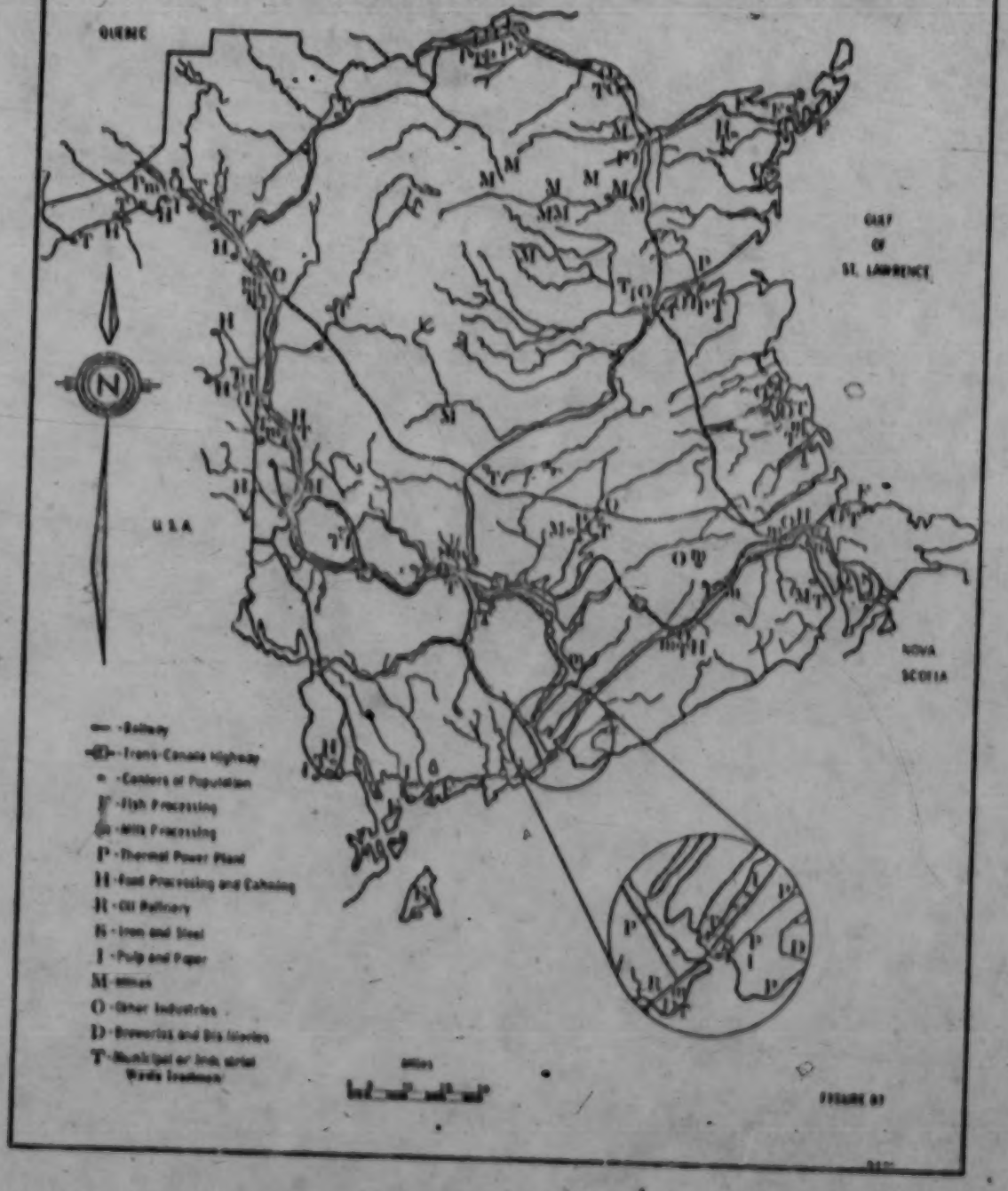
### 4. In Summary

The basic purpose of this appendix is to examine various aspects of the attributes which contribute to the economy of New Brunswick. The main picture has been one of deterioration when compared with Canada in numerous important attributes.

A summary of resource activity within the province is included in the appendix. Figure B-3 graphically summarizes the location of the natural resources and transportation systems within the province. No attempt has been made to estimate the demand or supply of the natural resources. Knowledge about the supply of natural resources would be necessary to determine whether resources act as a constraint to growth.

In terms of the model in the thesis, the purpose of the appendix is to provide information about New Brunswick growth. The latter section on various measures of well-being and production is important for this purpose. Although it is evident that personal incomes lack meaning as a proxy

# ECONOMIC ACTIVITY OF NEW BRUNSWICK



for production, they are valid for comparisons of standards of living and consumption capabilities. As well, economic growth will be evidenced by an increasing level of personal income. The most important measure of output, however, remains the gross national (provincial) product which is found in Table B-21. There are several factors not considered in calculating gross products, but only when these factors vary between regions or receive varying treatment in calculations do they become a problem when making comparisons. Thus, the data provided here permit an examination of growth, although they are subject to ambiguities.